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ABSTRACT

This paper analyzes verbal interactions between teachers and students to determine the speaking and listening skills which a teacher must possess. A simple model of classroom verbal interaction presents four possibilities: a) teacher-initiated conversation, b) pupil-initiated conversation, c) teacher response to pupil, and d) pupil response to teacher and/or another pupil. These four modes of classroom interaction permit 12 transitional possibilities from one mode to the other. In order to facilitate these transitions, the teacher must have the ability to a) inventory pupil ideas; b) reiterate, paraphrase, or expand on pupil ideas; c) relate pupil ideas to his own; d) react constructively to unexpected student statements; e) give criticism in a constructive manner; f) introduce his own ideas in ways which do not inhibit student participation; g) ask questions which generate student thinking; h) express and explain his own ideas clearly; and i) guide conversations according to models of inductive and deductive reasoning. (HMD)

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BASIC TEACHING SKILLS DERIVED FROM A MODEL OF SPEAKING AND LISTENING

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BASIC TEACHING SKILLS DERIVED FROM A MODEL OF SPEAKING AND LISTENING

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Introduction

Speaking and listening are fundamental elements of classroom interaction. Teachers and pupils talk to each other in a conversational sequence of speaking and listening which is basic to the teacher-pupil interchange. This paper analyzes the elements of speaking and listening in order to identify basic teaching skills that are essential to teacher-pupil interaction. Although the major emphasis is on skills associated with verbal communication, some aspects of nonverbal communication are also included in the analysis.

The procedure followed in this paper begins with a description of a simple model of conversation. Then the model is embellished and used to identify particular kinds of speaking-listening transitions. These transitions, in turn, suggest basic teaching skills associated with speaking and listening. The skills thus derived are considered to be basic precisely because speaking and listening are essential elements of the interchange between teacher and pupils.

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A Simple Model of Conversation

The verbal communication events between two persons occur in a sequence, and this sequence occupies a segment of time. While one person speaks, the other listens. The speaker then stops and starts to listen while the person who was listening starts to speak. As time passes, the interchange can be represented with a timeline display as shown in Figure 1.

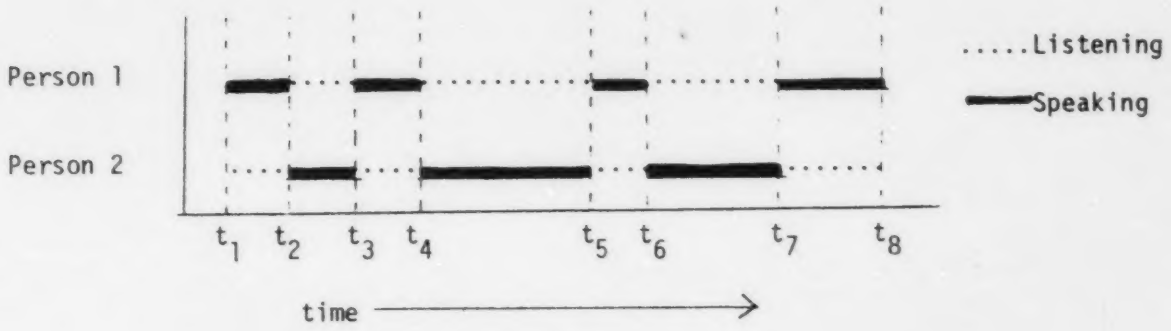

Figure 1

Two features of Figure 1 are easily identified. First, in this simple model a participant has only two alternatives--either he is speaking or he is listening. Second, the model displays reciprocal changes of participation which occur as transitions. These transitions, numbered in Figure 1 from left to right, identify points at which one person stops speaking in order to listen while the other person stops listening in order to speak.

A transition itself is instantaneous, or nearly so, and must be described by the events that precede and follow it. In Figure 2, which emphasizes the transition points, the small circles highlight the preceding

and following verbal events. These preceding and following events permit us to distinguish among different transitions. For example, if Person 1 asks a question (a preceding event) and Person 2 answers it (the following event), there is a transition which belongs to a class that could be called "question-response" transitions. Thus, by describing the events that precede and follow, we can identify and classify different transitions.

As it has been presented thus far, this model emphasizes verbal communication. Actually, nonverbal communication also occurs during conversation. The speaker can process information from the listener by watching his reactions. At the same time, the listener can interpret gestures, facial expressions, and other nonverbal events to give additional meaning to what he hears. This emphasis on verbal events does not mean that nonverbal communication is unimportant; it is primarily a matter of expediency. Conceptualizing the verbal events is the easiest way to distinguish one transition from another. In a later section of this paper, I will emphasize verbal and nonverbal skills more equally in identifying basic skills of listening.

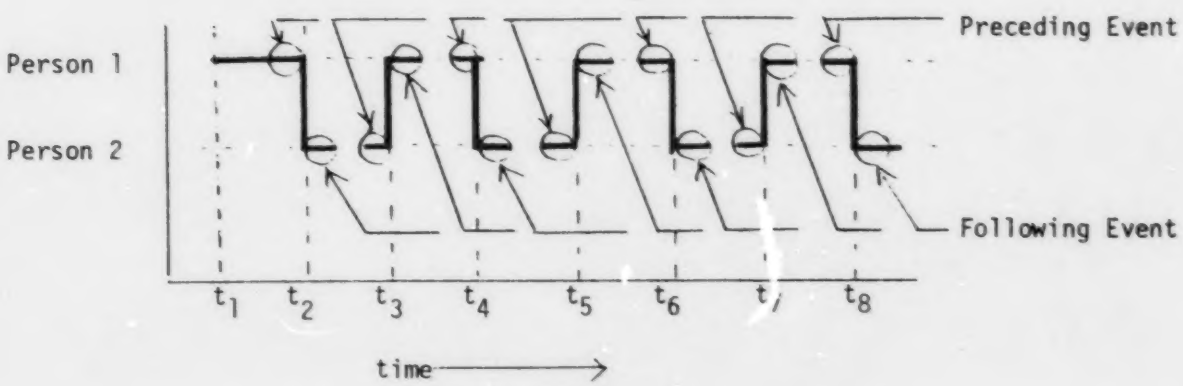

Figure 2

Figures 1 and 2 are most appropriate as representations of conversation in which the two or more participants belong to the same general status class--for example, one teacher talking to another or one pupil talking to his peers. To the extent that there is a difference in authority between two participants, it is reasonable to suppose that transitions are controlled more often by the person who has greater authority. Most conversations during teaching do not involve persons who belong to the same status class. A teacher has more power and authority than his pupils, and during most teaching encounters, subsequent events are more likely to be influenced by statements made by the teacher than by the pupils. It is possible for a teacher to curtail his authority-in-use (Flanders, 1970, p. 314) and thereby approach the conditions of peer conversation, but when this happens teacher statements take on a very different quality which can easily be recognized.

Given the status differences of the participants in most teaching conversations, it is desirable to build a model which focuses primarily on teacher statements. Figure 3 illustrates one way this might be done. The

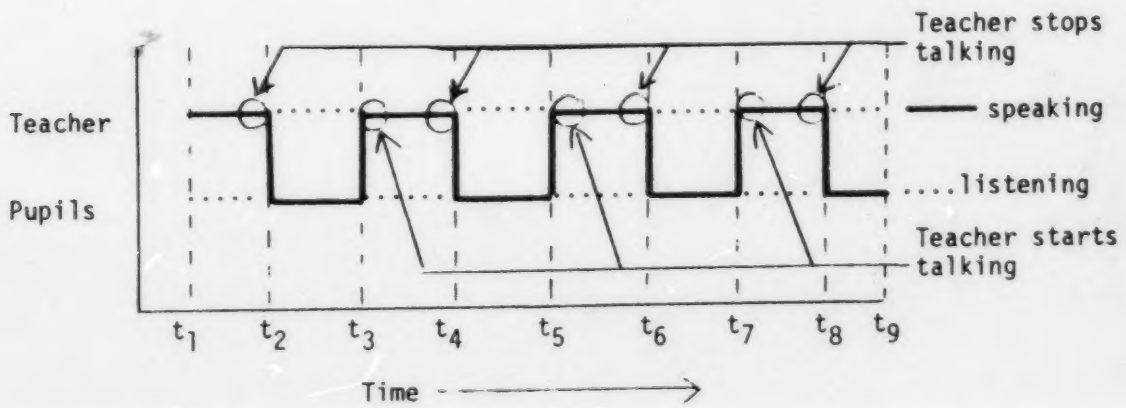

Figure 3

small circles in Figure 3 highlight the teacher statements which occur at transitions--that is, the last things said by a teacher just before a transition to pupil talk and the first things said by a teacher following a transition to teacher talk. To focus on teacher statements does not mean that what a pupil says is unimportant. Indeed, a teacher acts in order to achieve particular kinds of pupil participation so that judgments of success and failure in teaching would at least take into account quality of pupil participation. Nevertheless, basic teaching skills are evidenced in teacher behavior, even though their effectiveness may be judged by pupil behavior. The value of moving from Figures 1 and 2 to Figure 3 is that we focus on what the teacher says--on teacher behavior. Figure 3 suggests that a teacher's first statements after a pupil stops talking and his last statements just before a pupil starts to talk may be the most influential so far as the nature of pupil participation is concerned.

Before adding embellishments to this simple model of conversation, let's summarize what has been said. Figures 1, 2, and 3 present a model of conversation which limits participation to either speaking or listening. No distinctions are made among different kinds of statements or among different kinds of listening. The model takes into account the reciprocal relationships between speaking and listening when two or more persons interact. The model also focuses our attention on transitions and on the fact that transitions can be classified in terms of preceding and following events.

Speaking and Basic Teaching Skills

At this point, we will postpone a discussion of listening and deal only with speaking. We begin by modeling the speaking element of classroom interaction and identifying basic teaching skills. Then a brief section considers the issue of how elaborate the model should be to serve as an effective guide for teacher training and comments about procedures for training teachers in the basic skills identified.

A Model Involving Two Kinds of Speaking

In a single conversation circle, the teacher speaks, then one or more pupils, then the teacher, and so on. To illustrate the sequence, Figure 4 eliminates the dotted lines to indicate listening and includes only a heavy black line to represent speaking.

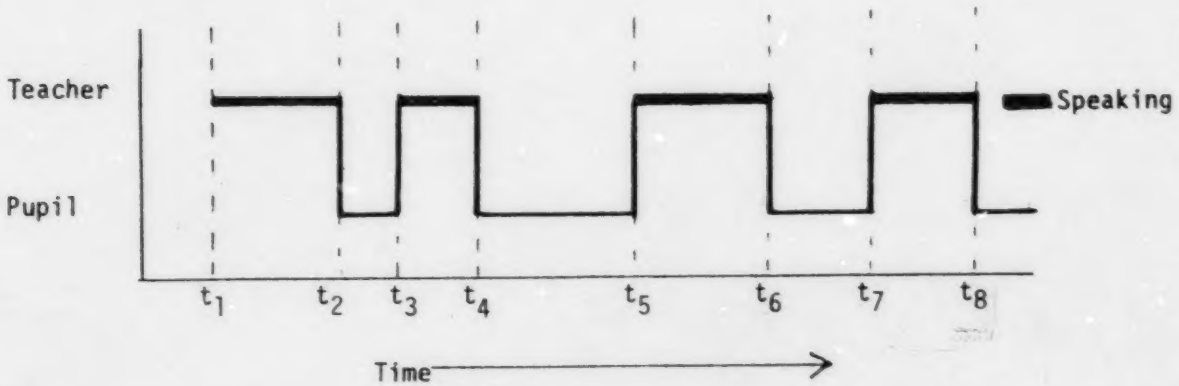

Figure 4

Notice the significant restrictions that are being placed on the model. The listening events have been discarded. Whether one pupil is responding to another pupil is not taken into account. Different kinds of statements are ignored. Nor have we decided how elaborate the model should be in order to serve its purpose (an issue discussed later in this paper). One principle to follow is that the model should be as simple as possible and still produce useful basic skills.

The model in Figure 4 presents only two kinds of events--either the teacher is speaking or one or more pupils are speaking. This also provides us with two kinds of transitions: first, from teacher to pupil and, second, from pupil to teacher. There is a mathematical relationship between the number of events and the total number of different one-way transitions between these events which is expressed by the formula,

$$N\,(N-1) = T$$

in which N is the number of events and T is the number of transitions. So long as the model admits only two events, teacher talk and pupil talk, there are only two transitions--2 x 1 = 2. Using the same formula, the following relationships hold:

Events in the model	Number of different transitions
3	6
4	12
5	20
6	30
7	42
8	56...and so on

It is easy to see that as we admit more kinds of statements as events in the model, the number of resulting different transitions increases rapidly. Since it is our purpose to study a reasonable number of transitions in order to identify basic communication skills, some limit to the total number of events is necessary. Perhaps a practical example will help.

Suppose we permitted the four kinds of statements which Bellack (1966, p. 4) identified as basic moves of classroom instruction: soliciting, responding, structuring, and reacting. If these four kinds of statements are allowed for both teacher and pupil, then there are eight kinds of events in the model. This results in 56 different kinds of transitions--a quantity that may be too cumbersome, especially for the "first round" of analysis in this paper.

Another basis for limiting the events in the model is found in Flanders' proposal (1970, p. 35) that both teacher and pupil talk can be usefully classified into initiation and response. It has been shown (Flanders, 1970, Chap. 12) that the proportion of teacher response to initiation is associated with such educational outcomes as pupil achievement and desirable pupil attitudes toward the teacher and toward learning. In the studies reported by Flanders, to initiate is to lead, to create a first event which then must be dealt with. To respond is to deal with an existing event, to comply, to conform, and in other ways to be influenced by the first event. It should be acknolwedged that there is a residual error in making this distinction. Some actions, particularly among pupils, are difficult to classify with this simple dichotomy. However, the residual error is small compared with the total number of events that can be reliably classified. Thus, the distinction does have practical value in analyzing teacher and pupil communication.

Figure 5 presents a timeline which shows some of the possible transitions given these four possible events: teacher response and initiation and pupil response and initiation. Suppose that just before t_2 the teacher asks a narrow question* and a pupil responds. At t_3, following the pupil response, the teacher initiates another idea. Before t_4 the teacher may ask a more open question,* based on his own ideas, and the pupil responds by first giving a direct answer to the question. However, the pupil might

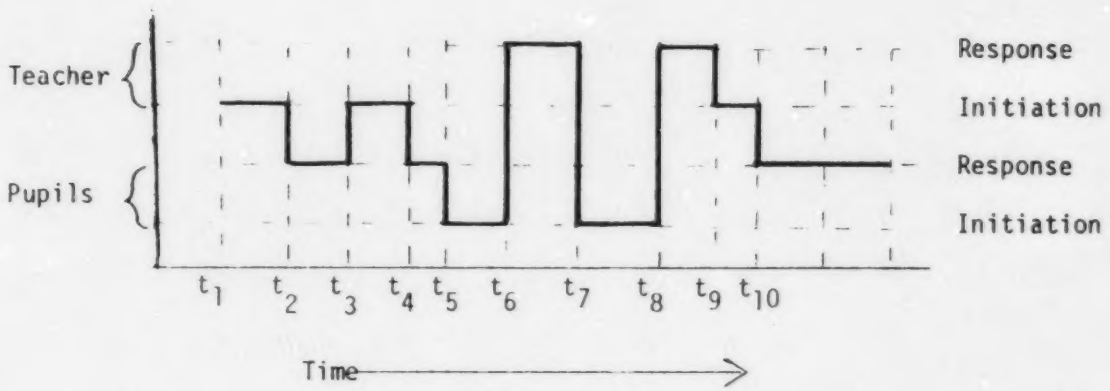

Figure 5

then expand on his answer by offering his own opinions. These opinions are new ideas in the sense of not being required by the teacher's statement and thus create a transition from pupil response to pupil initiation at t_5. Before t_6 the pupil continues to expand his idea, and the teacher than reacts to the pupil's ideas following t_6 (a transition from pupil initiation to teacher response). Before t_7, the teacher may ask the pupil to show how his idea would work and, as a result, the pupil continues to develop his own train of thought. At t_8, the teacher reacts to the expanded idea

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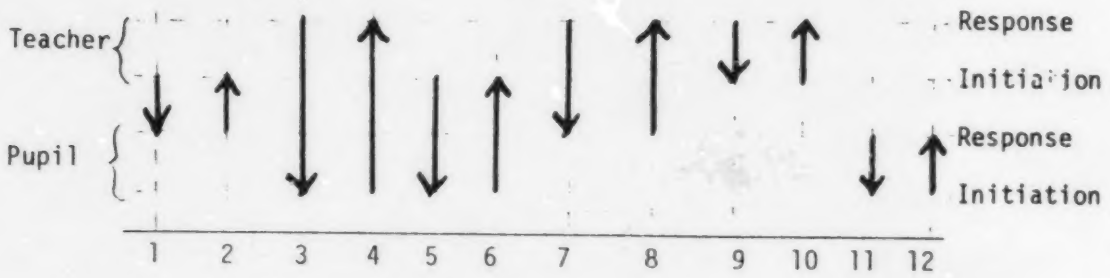
* A narrow question has one correct answer. An open question does not have one correct answer and is likely to solicit opinion, explanation, etc.

but then turns to a new idea of his own, thus creating t_9. The teacher then asks a narrow question to which a pupil gives a long response, indicated by t_{10}.



Twelve Possible Transitions

Figure 6

The foregoing sequence is restricted to four possible events, permitting twelve possible types of transitions. Figure 6 shows these twelve transitions. The first eight transitions occur during a teacher to pupil or pupil to teacher interchange. Transitions nine and ten occur during continuous teacher talk; eleven and twelve, during continuous pupil talk. Note that these latter four transitions elaborate on our earlier examples of a transition as simply a change in speaker. A transition occurs whenever there is a shift between any of the events admitted to the model.

Basic Teaching Skills Inferred from the Model

Proceeding from this model of speaking, we can identify basic teaching skills that are demanded by the varied types of transitions.

Transitions One and Two

Transitions One and Two involve teacher initiation and pupil response. The incidence of these transitions is above average when the purposes of instruction presumably require active supervision and control by the teacher. The more common examples would include the teacher's lecturing, with or without questions to check pupil understanding; giving directions and explaining assignments; and conducting more structured activities such as those associated with drill or correcting seatwork or homework. The role of the teacher in these situations is to start activities, to move to a new idea or new phase of activity when he thinks it is appropriate, to check on pupil understanding--in short to be very active in initiating classroom activities. The role of the pupil is to respond, to comply, and to act in accordance with the expectations of the teacher or the structure the teacher has created. There is considerable evidence (e.g., Flanders, 1970; Bellack, 1966) that these transitions are used the most frequently--actually too frequently when judged by measures of desirable pupil growth.

Basic teaching skills which these transitions demand might include the following. First, a teacher has the ability to express and explain ideas clearly; second, he can give directions so that they are clearly understood; third, he has a number of skills that are associated with

giving corrective feedback or criticisms in a constructive manner; and fourth, he knows how to ask narrow questions to which correct and incorrect answers can be easily identified.

Transitions Three and Four

Transitions Three and Four involve pupil initiation and teacher response. The incidence of these transitions is higher whenever the teacher has succeeded in encouraging pupils to express their own ideas, to make suggestions about the conduct of learning, or to present their own opinions about the issues at hand. The main skill probably lies in the fourth transition, when the teacher is responding to what pupils have said, rather than in the third transition. A skillful teacher can make use of pupil ideas in a number of different ways. He can merely acknowledge them, he can attempt to clarify and expand them, he can compare the ideas expressed by one pupil with those of another, and he can build questions which are based on pupil ideas. These occasions often occur during the latter stages of inquiry lessons or when current events and current social issues are discussed. In more advanced lessons, these patterns occur when pupils are proposing functional relationships (rules or laws) or attempting to formulate generalizations (applying rules or laws). There is some evidence (Flanders, 1965) that even a small increase in the use of these skills, one classroom compared with another, is associated with desirable pupil outcomes.

Basic teaching skills which these transitions demand might include the following. First, a teacher can reiterate, paraphrase, or expand ideas suggested by pupils; second, he can compare one pupil idea with

another or make use of pupil suggestions to move one step further in problem solving; third, he can guide the inductive thought cycle toward higher levels of cognitive thought; and fourth, he can formulate questions which make use of pupil ideas.

Transitions Five and Six

Transitions Five and Six involve teacher initiation and pupil initiation. The incidence of these transitions is above average when the pupils and the teacher appear to be on an equal footing, when both are expressing their own ideas as is likely to occur in a debate among equals. In these situations, there will probably be a strong element of testing the ideas expressed and of deciding which ideas are to prevail. There may also be occasions in which these transitions represent counterdependence, that is, points at which the pupils take exception to the purposes of the teacher and initiate counter alternatives. These transitions reflect a degree of maturity which seldom occurs in the interaction of the average classroom, regardless of age level.

Perhaps the most common form of Transition Five occurs when a teacher initiates an open question to which there is no specific, expected answer. These more thought-provoking questions serve as an invitation to the pupil to express his own ideas which may be given in the form of opinions, explanations, proposed laws, possible generalizations, and so on.

The basic teaching skill most often associated with these transitions is suggested first; the others are more speculative. A teacher can formulate open questions which encourage pupils to express their own ideas; second, he can introduce his own ideas without inhibiting the further expression

of pupil ideas; third, he can analyze ideas objectively and be less influenced by the biases which pupils express; and fourth, he can deal satisfactorily with unexpected statements of pupil initiative when he was expecting a responsive statement.

Transitions Seven and Eight

Transitions Seven and Eight involve teacher response and pupil response. The incidence of complete cycles involving both of these transitions is not likely to be high in normal classroom interaction, but Transition Eight is unusually critical in moving from a condition of high teacher initiation to a condition of high pupil initiation. Assuming that interaction is frequently teacher initiated, one way to encourage pupils to express their opinions or make procedural suggestions is to become genuinely concerned with their ideas. Using the skill of responding to pupil responses is a first step in moving away from the predomin pattern of teacher initiation. Transition Eight, rather than Seven, facilitates this strategem.

The basic teaching skills which are involved are centered primarily on how a teacher reacts to pupil statements made in response to teacher initiation. A teacher has the ability to inventory pupil ideas as he listens and to select certain of these ideas for further development; and a teacher knows how to acknowledge those ideas which are not selected so as to support pupil participation.

Transitions Nine and Ten

Transitions Nine and Ten involve teacher response and teacher initiation and therefore occur within an extended period of teacher talk. Transition Nine, from response to initiation, has a higher incidence of occurrence since a teacher may respond to what a pupil has just said before going on to introduce his own ideas. Transition Ten is somewhat awkward, but can be used to relate what the teacher has just said to something a pupil has mentioned earlier.

A basic teaching skill which might be inferred is that the teacher has the ability to respond to pupil ideas and then show how those ideas are related to the train of thought the teacher wishes to follow.

Transitions Eleven and Twelve

Transitions Eleven and Twelve involve pupil initiation and pupil response. These transitions occur during extended periods of pupil talk and therefore are not directly under the control of the teacher. Perhaps the more frequent transition is the shift from pupil response to pupil initiation. For example, a teacher may ask a narrow question to which a pupil may at first respond, but then continue to develop his answer in ways that go beyond the scope of the original question. Some open questions can also be answered with this pattern of pupil talk.

If there is a basic skill to be inferred from these transitions, it is that the teacher can ask questions which stimulate the transition from pupil response to pupil initiation.

Classification of the Basic Skills

Fifteen basic skills were identified in the preceding section from an analysis of twelve transitions. Here they are reorganized and grouped according to two dimensions: first, whether the skill is more likely to be used just after a pupil stops talking or just before a pupil starts to talk; and second, whether the skill involves teacher initiation or teacher response. Two of the skills do not fit easily into this two by two classification and are dealt with separately.

Skills used immediately following pupil talk

At the moment a pupil stops talking, the teacher has the choice of responding to what has been said or of more or less ignoring the pupil's statement by turning to another topic. Both actions are necessary in teaching, but the teacher's predominant choice is a feature of the interchange over a period of time. Patterns of response as the teacher starts to talk include reinforcement in general, selective reinforcement in particular, and various ways of using pupil ideas. Another possibility is criticism or corrective feedback. On the other hand, patterns of non-response may include teacher initiation of a new topic, thereby moving to the next phase of problem solving, or introduction of a new unit of thought. The skills listed below reflect these two alternatives.

Responsive skills: When a teacher chooses to respond to what a pupil has just finished saying, several skills come into play.

A teacher can--

(1) inventory pupil ideas as he listens and select certain of these ideas for further development (from Transitions 4 & 8).

(2) reiterate, paraphrase, or expand ideas suggested by pupils (Transitions 4 & 8).

(3) acknowledge pupil ideas not selected for further development and thereby sustain pupil participation (Transition 8).

(4) show how ideas previously expressed by pupils are related to his own ideas (Transitions 9 & 10).

(5) react constructively to the surprise of unexpected pupil statements (Transition 6).

Initiation skills: When a teacher chooses to take the initiative and introduce his own point of view or his own ideas after pupil talk, there are several skills which come into play. A teacher can--

(6) give criticism and corrective feedback in a constructive manner (Transition 2).

(7) introduce his own ideas in ways that do not inhibit further pupil participation (Transition 6).

(8)* react to ideas in a way that fosters an objective analysis of ideas (Transition 6).

Skills used immediately preceding pupil talk

Just before a pupil starts talking, the teacher may extend an invitation for pupil participation or he may direct the pupils to participate. Under

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* It is obvious that Skill 8 could occur in a responsive mode. It is classified under initiation because the teacher's point of view is more often "new" to the pupils who are involved.

the conditions of Transitions 5 & 6, when both teacher and pupils initiate, the opportunity to talk may occur just because the teacher paused for breath. It is interesting that Borg, et al. (1970, p. 74) found it necessary to train teachers to pause for three to five seconds after asking a question (a euphemism for "keeping your mouth shut") in order to give pupils time to answer. It is reasonable to suppose that "pausing for breath" will provide opportunities to enter the conversation for only the most alert pupils and that most will require a more direct invitation.

Responsive skills: When a teacher chooses to support the continuation of pupil initiation or when he is trying to create opportunities for pupil initiation, he can ask questions about what pupils have said or otherwise develop selected pupil ideas. A teacher can--

(9) ask questions which solicit comparison of pupil ideas, call for further development, extended explanation, etc., or otherwise make use of pupil ideas (Transition 3).

(10) ask open or narrow questions about pupil ideas (Transitions 3 & 7).

Initiation skills: A teacher can offer invitations to participate on his own terms, so to speak, by asking for reactions to his own ideas or actions. A teacher can--

(11) ask narrow and open questions based on his own ideas (Transitions 1 & 5).

(12) give directions that can be clearly understood (Transition 1).

(13) ask questions which stimulate a pupil to expand beyond the expected answer (Transition 11). (Note: This could be considered a special case of asking broad questions.)

Not classified above

Two of the fifteen suggested basic skills are not classified at this point. It is difficult to classify these skills because it is not obvious whether they would occur just before a pupil starts to talk or just after he finishes. The two skills are listed below. A teacher can--

(14) express and explain his ideas clearly (usually Transition 1).

(15) guide conversations according to models of inductive and deductive thinking (Transitions 3, 1, 2, and 4).

Summary of Basic Teaching Skills, Restricted Model

Toward a core of basic skills

The fifteen skills listed in the previous section would make an interesting curriculum for skill training in teacher education. However, it is possible that this list is too long for application in a preservice teacher education program. First, skill training of all kinds is but one part of the professional education of a teacher, even though an important part. Teachers will also need to learn something about the history, philosophy, and psychology of education, and then there are also the fields of curriculum development and teaching methods within the specialized areas of the curriculum. Second, there are other kinds of basic teaching skills. It is possible that some preactive skills for planning instruction, skills associated with classroom management, skills of individualizing and evaluating pupil learning, and perhaps others will also be considered essential. The fifteen skills just listed are based on verbal communication and thus refer to that one part of teaching.

If I were to nominate two skill clusters from among the skills that have been identified, I would choose and combine as follows. First, skills one and two form a core of responsive acts which can occur just after a pupil stops talking. The teacher's ability to use pupil ideas so that he can reiterate, paraphrase, or expand these ideas seems to me absolutely critical. Second, skills ten and eleven form a core of initiatory acts which solicit pupil participation and are likely to occur just before pupils participate. Here we are concerned with the skills of formulating and pacing different kinds of questions as well as directions.

Glaring omissions

Based on my own writing and thinking about basic teaching skills, the foregoing list fails to include the following basic teaching skills which are more or less related to verbal communication.

First, the most effective and artistic teachers who have turned up in my research studies knew how to integrate what educators often identify as the "affective" and the "cognitive" elements of communication. It is my impression that these teachers did not consider these as separate and distinct elements as is so often done in educational writing. Instead, they seemed to know that cognitions about subject matter usually prevail, but that discussion can turn to cognitions about feelings and attitudes. In fact, logical analysis can be applied to the affective components of a problem whenever this is necessary. The skill, if there is one, is the ability to know how and when to interrupt the prevailing subject matter emphasis and instead focus on the feelings and attitudes of the pupils.

Transitions from a cognitive to an affective focus would appear in our simple model of conversation if initiative and responsive statements were further divided into these two divisions.

Second, there is some evidence (Flanders, 1965, p. 102) to suggest that more effective teachers create interaction patterns which display a degree of "flexibility." In terms of our model, a flexible teacher would be one who has a wide repertoire of initiative and responsive acts and can arrange these acts into a great many different sequences. The skill, if one exists, is to know how and when to shift from a responsive to an initiative mode and vice versa in terms of the exigencies of the situation. Further, a skillful teacher might actually plan this kind of flexibility as part of a lesson plan. The only way considerations of this kind could be inferred from our simple model of conversation would be to extend the time span and trace teacher and pupil initiation over longer periods of time.

Third, a model of conversation is not likely to lead to what I think is the most basic of basic teaching skills, namely, the ability to inquire into one's own teaching behavior regularly and to use systematic procedures when conducting such inquiry. Perhaps one shouldn't fault a model of conversation for this omission; a person interested in developing such skills would more likely start with a model of inquiry and apply it to the self-development of teaching skill. Nevertheless, skills of inquiry are a part of speaking and listening. If different kinds of speaking were incorporated in our model, inferences about inquiry might become possible.

Some tentative conclusions

Starting with a simple model of conversation, it has been possible to identify about fifteen proposed basic skills of verbal communication. It was suggested that the pressure to include many different kinds of training in preservice and inservice teacher education may limit the total number of skills primarily related to verbal communication which can be given attention. Two core skill areas were nominated as essential: (a) responsive acts which make use of pupil ideas and which occur just after a pupil stops talking; and (b) initiatory acts which solicit pupil participation and which often occur just before a pupil starts talking. One or two omissions were noted, and these appeared to be the result of starting with a highly restricted model of conversation.

How Elaborate the Model?

This section contains a short and much too brief discussion of the consequences of making finer distinctions in initiation and in response, that is, in the two kinds of events which were incorporated in our model of conversation. The thesis to be explored is that the model is essentially independent of the number of distinctions one may wish to make in order to identify basic teaching skills.

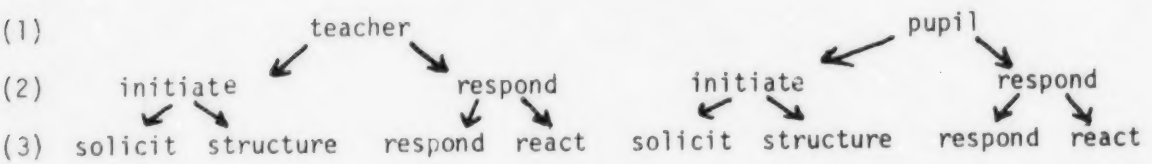
Using Bellack's four moves

Bellack's total system for analyzing the language of the classroom involves the multiple coding of single events; in fact, no less than eight

classifications are made of each event. Each of the eight classifications has its own category system: the first classification is categorized into teacher talk and pupil talk; the second involves distinguishing between soliciting, structuring, responding, and reacting; and the six substantive/logical/instructional classifications which follow each make use of many subdivisions involving as few as nine or as many as twenty-two categories. The total number of distinctions is very large since all possible combinations are theoretically possible. In the total system, the number of distinctions is of the order of 70 which would permit approximately 4,830 different transitions. Some of these transitions can be eliminated because of low incidence, awkwardness, or redundancy. Nevertheless, it is clear that with more elaborate category systems that make use of multiple coding, finer distinctions will give more information.

There is a relationship between the two categories of initiation/response and the four moves of soliciting, structuring, responding, and reacting. This relationship can be shown by the decision ladder which the encoder moves down in order to classify.

Encoding Procedure



It is Step 3, involving eight distinctions or types of events, which produces the 56 transitions mentioned earlier.

Invoking parsimony

Given the practical limitations of educating both experienced and future teachers, it should be possible to agree that identifying too many skills based on too many transitions would make training impossible and that too few transitions would make the training ineffective, or at least inconsequential. This is to say that there must be an optimum number of transitions which could be analyzed to identify the fewest number of basic teaching skills. In this context, the word "fewest" means that some small number (one, two, or three?) of basic skills within each of several classes of basic skills (communication, planning, evaluation, classroom management, etc.) is selected for the first round of teacher training. If successful, the first round of training with selected basic skills would prepare a trainee for further self-directed training and inquiry into his own teaching behavior in each skill area.

Inclusiveness and cycles of training

One purpose of showing the three steps of the encoding procedure on the preceding page is to illustrate that each concept used to describe behavior can be subdivided to make finer distinctions. What Flanders means by initiation is quite similar to what Bellack means by soliciting and structuring, and response is quite similar to responding and reacting. The concept of initiation is more inclusive since it comprehends both soliciting and structuring.

One might defend using a model of conversation which permitted only four events (and therefore produced only twelve transitions) by proposing

the following principles. First, the events of the model should be conceptualized at the highest level of inclusiveness (in the sense of abstraction) that still permits practical distinctions in terms of behavior. The point here is that any event that is abstracted must be described so that a trainee can determine the presence or absence of this event in order to practice the skills which are involved. Second, since the events chosen are more inclusive, subsequent training can proceed by several cycles of subdividing in which more subtle distinctions are made at each new cycle. Third, as recycling introduces more refined and subtle distinctions, the trainee can practice teaching skills which become increasingly complex and difficult.

Perhaps an illustration will help. Suppose the first cycle of training in the basic skills of communication began with making a distinction between teacher and pupil talk and between initiation and response. The basic four event model could be introduced, the notion of transitions could be clarified, and the significance of behavioral events just before and just after transitions identified. The skills involving each type of transition would be practiced. At the transitions from teacher to pupil, the trainee learns that the skills are related to the question, "How do I (the teacher) provide an opportunity for pupil participation that is most appropriate at this point?" At the transitions from pupil to teacher, he learns that the skills are related to the question, "What can I (the teacher) do with the contribution that the pupil has just made?" Certain skills and methods of analyzing teaching behavior have been learned, and the trainee has learned how a model can be used to guide thinking. As soon as he learns this much, if not before, the trainee will identify problems which require

more subtle distinctions among behavioral events. He may decide, for example, that he would like to divide initiation into soliciting and structuring. Hopefully, he has the necessary skills in analysis and behavior modeling to make this extension in his thinking. He has started down a road that leads to more advanced problem solving. His learning is automatically arranged to proceed from less difficult tasks to the more difficult.

A parsimonious solution

The thesis that the model of conversation which has been presented is independent of the number of distinctions to be made among behavioral events can now suggest a parsimonious solution. First, the most simple model should provide an opportunity for the trainee to learn transitions, sequential analysis, and a limited number of basic teaching skills. Second, through refinement and subdivision, the number of events taken into consideration can be increased in subsequent cycles of training, and this, in turn, may permit an analysis of more complex teaching skills and teaching strategies. In the second stage, the model itself is reasonably independent of the number of distinctions because the trainee can move on to more complex skills by using more categories for classifying verbal communication, while the model itself remains intact.

Designing Practical Training Programs

The purpose of proposing basic teaching skills is to identify a core of skills for teacher training. If the skills proposed do not lend themselves to practical training procedures, one can question the utility of the proposals. Preservice teacher education is especially limited in terms of time, space, and instructional resources, and the same is true of in-service education, although the time pressure may be somewhat less stringent. In either case, the contribution is incomplete when only basic skills are proposed because practical training procedures are equally important from the standpoint of a viable teacher education program.

Given the limitations of teacher education, the conceptualization of basic skills should be parsimonious and the training procedures should be efficient. The simple model of conversation used in this position paper helps to identify certain behavioral events of verbal communication. These behavioral events can be strung together to form patterns of interaction. The patterns can be called basic skills and the ability to identify these patterns, to create them, and to string them together into teaching strategies is what we mean by applying basic teaching skills to instruction. To be parsimonious, there are relatively few concepts--such as transition, classes of transitions, sequence, initiation, response, and so on--and each of these concepts should lend itself to subdivision in order to permit dealing with more complicated problems. To be efficient, the training procedures should establish techniques for analyzing teaching behavior which can then be applied to a number of different skills.

When concepts and training procedures fit neatly together, efficiency is more likely to result. The concepts have to be recognized as behavior or features of behavior. Training provides opportunities to practice these behaviors under conditions which permit constructive feedback to occur. The skills and associated training procedures are more efficient when they are arranged into a sequence that is compatible with adult learning.

Training procedures which are compatible with the concepts introduced by the model of conversation have already been published (Flanders, 1970, Chap. 9). It would be a misuse of space to include them in this position paper. As a convenience to the reader, a reprint from Chapter 9, Analyzing Teaching Behavior, can be found in the Appendix. Below is an outline of the more salient features of what might become an efficient, compatible training program, given further development.

A. Two models
   1. A five step inquiry model which guides professional self-development when one's own behavior is to be an object of inquiry.
   2. A flexible system of interaction analysis, with categories which can be subdivided and which supports microteaching experiences and provides a "timeline display" ready at the instant observation ceases.

B. Successively more complex training using the above two models.
   1. Level One: Three patterns involving lecture, drill-review, and giving assignments are usually skills teachers already use.
   2. Level Two: Three patterns involving open questions, responsive skills, and "because extensions" is a useful place to start training.

3. Level Three: Advanced self-development projects that include strategies for controlling pupil independence and teacher initiation, analyzing feelings and the affective domain, identifying levels of thinking, and further refinement of Level One skills.

The training techniques outlined above and partially reproduced in the Appendix are directly applicable to analyzing, identifying, and practicing skills which appear just before a teacher stops talking and just after a teacher starts to speak following a pupil. As a result of contemporary work on training modules for teacher education (Borg, et al., 1970, for example), it now would appear that carefully developed training modules covering different steps of the process will be helpful, if not necessary. Any practical system which might result would have to be continuously evaluated and appropriate revisions carried out.

Listening and Basic Teaching Skills

Both speaking and listening are included in the model of interaction presented earlier in this paper (see Figures 1, 2, & 3). This model has been used to identify basic teaching skills that are involved in speaking; we now turn to an analysis of listening. The goal is to identify the fewest number of listening skills that will enhance initial training and then will lead naturally to learning more complex skills. The procedure is to speculate about the mental processes which occur when a teacher listens to pupils and then to analyze the teaching skills that are involved.

In the analysis of speaking, non-verbal behavior received very little attention. One consequence of ignoring the non-verbal behavior of a speaker, especially a teacher, is that a good deal of communicative behavior is ignored. For example, teachers can give directions with the movement of a finger, or they can focus attention with eye contact or by pointing while they are at the blackboard, and this list of non-verbal behaviors could be extended until it is quite long. Yet it is not clear how much the omission of non-verbal behaviors in the first sections of this paper actually limited the main purpose of identifying important skills of teaching. The responsive and initiative skills that were identified in the analysis of speaking could have been derived from an analysis of non-verbal behavior by using essentially the same procedures. For the most part, the skills that have been identified thus far can be demonstrated with verbal or non-verbal behavior or with a combination of both types of behavior. Thus, it may be argued that ignoring non-verbal behavior has not seriously weakened the propositions that have been identified as basic teaching skills.

Listening and the skills associated with it may not lend themselves to the same treatment. Here we are concerned with the activities of the silent member of a conversation circle. Attention to non-verbal behavior may now play a more significant part in analyzing teacher-pupil interaction, especially when the teacher is listening to pupil talk. However, our purpose is not to carry out an extended analysis of listening itself. Instead, our goals are restricted to the teaching skills associated with listening. The non-verbal behaviors that will play a part in the analysis are those which a pupil exhibits as he talks, and thus they become part of the

phenomena with which a teacher is concerned when he listens. In short, a teacher not only receives information by sensing tempo and hearing sound, inflections, and emphasis; he also sees shapes and colors and perceives motion. In this section, we assume that both hearing and seeing are essential to the analysis as well as to the skills of listening itself.

A Model for Analyzing Listening

It is hard to imagine any aspect of teaching that is more critical to success than receiving, classifying, abstracting, storing, and then acting on the information that is inferred from pupil behavior. The total process is extremely complex, and the speculative treatment in this paper does an injustice to the nature of the problems but reflects the limitations which the author brings to the task. The possibilities for excursions into systems of logical thinking, how personal values influence teaching priorities, or even how stereotypes bias our abstractions are all inviting, but beyond the scope of this paper.

The approach I will take is to present a model of the critical steps of listening and then see if this leads to the identification of basic skills of listening for the teacher. An outline of this model is shown in Figure 7. To read this diagram, begin with pupil behavior represented in the upper left-hand box. The verbal and non-verbal elements of this pupil behavior are heard and perceived by the teacher. It is quite possible that the activities of Phases I, II, III, and IV occur simultaneously or at least cannot be considered as distinct and separate activities, one following another.

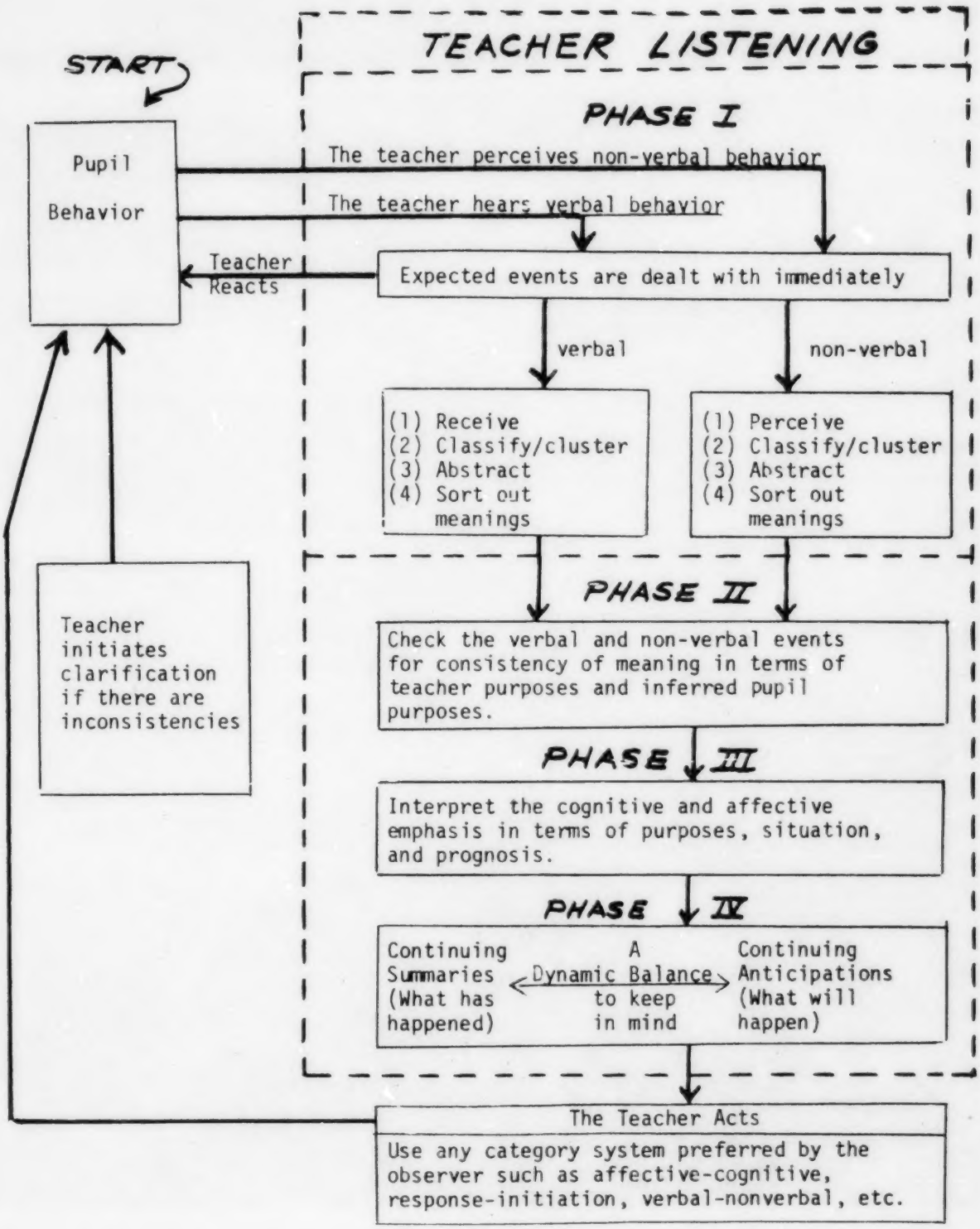

TEACHER LISTENING
START
PHASE I
Pupil Behavior
The teacher perceives non-verbal behavior
The teacher hears verbal behavior
Teacher Reacts
Expected events are dealt with immediately
verbal
non-verbal
(1) Receive
(2) Classify/cluster
(3) Abstract
(4) Sort out meanings
(1) Perceive
(2) Classify/cluster
(3) Abstract
(4) Sort out meanings
PHASE II
Teacher initiates clarification if there are inconsistencies
Check the verbal and non-verbal events for consistency of meaning in terms of teacher purposes and inferred pupil purposes.
PHASE III
Interpret the cognitive and affective emphasis in terms of purposes, situation, and prognosis.
PHASE IV
Continuing Summaries (What has happened)
A Dynamic Balance to keep in mind
Continuing Anticipations (What will happen)
The Teacher Acts
Use any category system preferred by the observer such as affective-cognitive, response-initiation, verbal-nonverbal, etc.

Figure 7

Model for Analyzing Listening

In Phase I, behavioral phenomena are received and subjected to mental operations which give them meaning. Expected events may trigger a quick recycle of listening.

In Phase II, the consistency of verbal and non-verbal phenomena is checked in terms of the teacher's purposes or the purposes of the pupil which a teacher can infer. In the event of inconsistency, a teacher may initiate questions designed to clarify his interpretation of what he has seen or heard which creates a recycling of listening.

In Phase III, the teacher may decide that the affective component of the behavior is so predominant that it should be dealt with separately rather than letting it remain an unidentified feature of the main subject matter emphasis which characterizes most teacher-pupil interaction. Again, the recognition of anomalies may stimulate teacher questions for clarification and thereby recycle the listening process.

Phase IV proposes that there is a continuing attention to completed events and a continuing anticipation of what will happen next which create a dynamic balance or tension system within the teacher. This tension system builds conjectures about what will happen next compared with the presumed purposes of the interaction such that at some moment the teacher acts. He may stop listening and start to talk or simply instigate a non-verbal behavior while he continues to listen. This might be described as a shift from passive to active participation. The classification of the teacher's active behavior will depend on the category system that the observer prefers.

Inferring Basic Teaching Skills

Phase I--creating meaning

Pupil behavior impinges on the senses of a teacher in small bits. My preference in theorizing about these bits is to borrow the "foreground-background" notions from Gestalt psychology. Because a teacher has a purpose and looks for certain events he expects will happen, the occurrence of an expected event quickly assumes a position in the foreground and can be acted on immediately. Thus, a single bit, such as a word or a gesture, has sufficient meaning for the teacher to react. A rapid interchange, teacher and pupil, illustrates this pattern. Simultaneously, many other events occur, but these assume positions in the background where they may be inventoried, clustered, and stored, if not ignored. As the bits assigned to the background gradually assume meaning, the teacher may choose to react to them, providing he can develop a useful relationship among the meanings of a cluster, the present state of affairs, and his instructional purposes.

The steps of thinking in perceiving, classifying, clustering, and abstracting meaning are largely inductive. However, the skills of using inductive thought processes may well be unfamiliar to most teachers. Teachers have little formal training in logical thought processes and other learning experiences, such as contacts with parents and former teachers, and seldom encourage the individual to become self-conscious about the steps that are involved in thinking. Furthermore, the thought processes exemplified by instructors in teacher education have a more deductive than inductive character; generalizations are first stated and then examples are given to

illustrate what the generalization means. These assertions suggest that the basic skills of inductive thinking either don't exist or are underdeveloped in many teachers. It may be this lack of familiarity that causes many teachers to become excited about the inductive emphasis of "inquiry teaching" since it presents a new way to guide pupil thinking, one that many teachers have not experienced very often.

Taba (1965) believes that principles of inductive thinking can be taught to both teachers and younsters providing enough is known about the steps involved and providing repeated practice in using these steps can be arranged. A few teacher educators with whom I am acquainted have developed instructional materials for this purpose. Many of these materials permit the adult learner to: first, inventory objects, the attributes of objects, or simply ideas (the concepts which represent ideas); second, group these items into clusters according to some stated logic; third, label the clusters with a concept; and fourth, use labels in forming sentences which stand for functional relationships or tentative generalizations. Such materials follow the procedures recommended by Taba for teaching social studies or science in the elementary grade levels.

The activities in Phase I do suggest basic teaching skills. These may be a family of skills which are involved in the inductive thinking processes: the ability to perceive bits of information, to classify these bits, to organize them into clusters with labels, and to formulate functional relationships using the labels. A second skill or family of skills may someday be formulated which is concerned with thinking simultaneously about expected events as well as those events which are stored and dealt with at a slower pace. Kounin's ( ) concept of "withitness" implies

that a teacher who is "with it" can make better judgments about when to turn away from the expected events and attend to a growing syndrome of background events, originally assigned to storage, by retrieving and acting on them because they create a higher priority.

Phase II--checking inconsistency

Once events assume some kind of meaning, a teacher may wish to check the consistency of these meanings. When a teacher asks a pupil whether he is interested in arithmetic, the reply may be, "Well, I guess so," but the pupil may speak indifferently and be slumped back in his seat as if to withdraw. The verbal and non-verbal information is inconsistent. Alternatively, a few pupils may be actively providing expected behavior while the majority of the class presents unexpected symptoms of indifference. This is a case of inconsistency between foreground and background information. Inconsistencies such as these, along with many others that could be imagined, provide information from which an alert teacher may infer that the goals of teaching are not adequately accepted by the pupils. Planning activities that actively involve the pupils in clarifying the goals of instruction and establishing individual learning tasks are likely to minimize the incidence of conflicting goals.

If a basic teaching skill can be proposed with regard to Phase II, it could be to have the teacher know how and when to initiate questions that attempt to clarify inconsistencies between verbal and non-verbal information and between the goals the teacher infers from pupil behavior and the instructional goals the teacher has in mind.

Phase III--Interpreting the cognitive/affective emphasis

This section is included with some misgivings. First, we educators cling to the affective/cognitive dichotomy without really understanding its utility in the analysis of teaching; and second, the phenomena to be discussed in this section might better be conceptualized in Phase II as an inconsistency between goals and needs of pupils and the goals and needs of the teacher.

Nevertheless, circumstances arise in teaching in which the predominant emphasis on subject matter cognitions is better set aside to attend to cognitions about pupil attitudes, feelings, and the general emotional tone of the class. It is unfortunate that the examples usually suggested to illustrate attention to the affective domain, emphasize negative attitudes which can create problems of disruptive behavior. There may be a far greater pay-off when a teacher chooses to attend to the more constructive feeling tones of enthusiasm, happiness, and the sheer joy of success. A teacher may also find it useful to anticipate positive feelings, talk about them with the pupils, and even generate excitement and curiosity about how these feelings will develop.

The reason for considering the affective domain in this separate section is that there is a particular skill which teachers who are more effective usually possess. This is the skill of knowing when and how to focus attention on feelings and attitudes in ways that support rather than detract from the subject matter goals of learning. Probably several steps are involved. First, awareness and sensitivity to pupil feelings and attitudes may reflect special skill in Phase I activities such that behavior clues which express

emotional tone are stored and conceptualized with a higher priority. Second, judgments are made in Phase II and III in which the affective elements in the situation are compared with the purposes of the teacher and the inferred purposes of pupils, and these judgments may make predicting more accurate in Phase IV. To summarize, the skill is knowing when and how to clarify feelings and attitudes in order to support anticipated learning activities or to avoid detracting from them.

Phase IV--the dynamic balance of the moment

It was Thelen (1960, p. 188) who said: "Time is a mountain whose peak is the present. The past slopes off one side and the future off the other. Looking in one direction we make explanations: looking in the other, predictions." As a teacher listens, he tries to make sense out of what is happening and predict what will happen next. Phase IV is inserted into this analysis in order to explain why a teacher will suddenly shift from more passive listening and engage in more overt participation.

According to our conjectures thus far, a teacher makes sense out of what has happened by placing some events in the foreground and others in the background of his thinking. Expected events may more often be placed in the foreground since they are more likely to be associated with his teaching purposes. Unimportant events and those that are unexpected in the sense of being less related to the teacher's purposes are inventoried, classified and put into clusters, conceptualized in some way, and then stored in the background of his thinking. Some dramatic unexpected events, of course, assume positions in the foreground because they cannot be ignored,

but this is an exception rather than the rule. Since the phenomenal field provides constant input and since we may presume that there are limitations in our capacity to store information for immediate recall, there must be a fairly constant loss of specific events as they are gradually replaced by higher order abstractions. As a result, a series of encounters which occurred during the first five minutes of instruction may be almost lost ten minutes later because they are hidden under the abstract label, "the introduction was successful in stimulating class interest." Once this inference is reached, the teacher may be less sensitive to cues which indicate that a particular child is not interested in his learning task.

The dynamic balance of past explanations and future predictions that is in the mind of the teacher can create a tension system because his teaching strategy is based on learning goals and particular purposes of instruction. The events that are now occurring and the past events which have been stored are constantly being reevaluated in terms of goals and purpose. Let's assume that there are two basic ways that the teacher can act. First, he can respond to current events and support their continuation because he sees them as consistent with goals and purpose. Second, he can intervene to initiate a new direction by modifying what is going on. This modification may be very slight or it may be quite abrupt and apparent, but in either case, the intervention occurs because the teacher sees some inconsistency between goals and purpose compared with anticipated next events. How long a teacher will tolerate a trend in the events which is away from his goals and purpose probably varies greatly within the same teacher and certainly between teachers. There is also great variation in what action is most often taken once the teacher does decide to act. For example, a

teacher may take matters into his own hands and initiate corrective action. On the other hand, he may choose to ask questions designed to help pupils see the inconsistency that he sees and in other ways share the responsibility for taking corrective action. However a teacher does act, what he does will depend on the skills associated with Phases I, II, and III. In this way, Phase IV summarizes and incorporates the first three phases of the model.

Are there any particular teaching skills associated with Phase IV activities? I don't really know, but I would like to think that we teacher educators would be smart enough to conceptualize the behaviors of deciding when and how to intervene and that we could then design training experiences which would improve this aspect of teaching. Here are some skills that might be nominated as worthy of further investigation. First, we could train teachers to use response actions which would encourage pupils to share in diagnosing inconsistencies between what is happening and what needs to happen in order to reach agreed upon goals of instruction. Second, we might find a way to train teachers to be more tentative in formulating their abstract summaries of past events and thereby be more sensitive to unexpected events that suggest misconceptions in summarizing past events. A third skill might result from giving teachers training experiences which show that sometimes it is possible to change the goals of instruction and still achieve desirable educational purposes. A fourth skill is to learn to use various intervention techniques so that teachers have a large repertoire and can choose the most appropriate type of intervention.

Summary of listening skills for teachers

From Phase I comes the most important set of skills: a teacher has the ability to perceive bits of information from pupil behavior, to classify these bits, to organize them into clusters with labels, and to formulate functional relationships using the labels.

Phases I, II, and IV: A teacher reacts to expected events one after another and, at the same time, inductively processes information in such a way that the summary labels are kept tentative so they do not inhibit the receiving and processing of conflicting information.

Phases II, III, and IV: A teacher has the sensitivity, skills, and convictions necessary to initiate questions that will help to clarify inconsistencies among the behavioral phenomena whenever such inconsistencies are noticed--especially in regard to cognitions about feelings, attitudes, subject matter, and group processes.

All Phases: A teacher is quite self-conscious about maintaining a balance resting on a fulcrum of agreed upon goals of instruction, between explanations of past events and predictions of next events; the teacher can establish flexible patterns of intervention because he has a wide repertoire of intervention skills; a teacher develops the courage and convictions necessary to use intervention judiciously.

Some Reflections on Teacher Listening and Speaking

The conceptualization of teacher listening skills has been ignored too long in the field of teacher education. These skills are basic to all teacher-pupil encounters.

Listening and speaking skills are so intimately interrelated that in some instances they seem to be almost identical. For example, responsive speaking skills may actually be listening skills since they often serve to improve listening accuracy and correct a teacher's misconceptions.

The dynamic balance described in Phase IV of the model for teacher listening may suggest some kind of decision making model. How does a teacher decide when he should intervene? How does he choose among alternative interventions? Here again, the close interrelationship of listening skills with speaking skills is quite apparent since a decision point recognized by listening will most often provoke a verbal intervention. It is quite possible that the skills of speaking and listening should not be taught separately to teachers even though they are conceptualized in different sections of this paper.

The central challenge to those of us who seek to identify basic teaching skills is to select for the first round of teacher education those skills of speaking and listening which have the greatest potential for subsequent professional self-development. These would be basic skills because they are pervasive whenever teachers and pupils interact and because they provide heuristic experiences that facilitate continuing education for teachers.

TABLE 2–1
Flanders' Interaction Analysis Categories* (FIAC)

Teacher Talk	Response	1. *Accepts feeling.* Accepts and clarifies an attitude or the feeling tone of a pupil in a nonthreatening manner. Feelings may be positive or negative. Predicting and recalling feelings are included.
		2. *Praises or encourages.* Praises or encourages pupil action or behavior. Jokes that release tension, but not at the expense of another individual; nodding head, or saying "Um hm?" or "go on" are included.
		3. *Accepts or uses ideas of pupils.* Clarifying, building, or developing ideas suggested by a pupil. Teacher extensions of pupil ideas are included but as the teacher brings more of his own ideas into play, shift to category five.
		4. *Asks questions.* Asking a question about content or procedure, based on teacher ideas, with the intent that a pupil will answer.
	Initiation	5. *Lecturing.* Giving facts or opinions about content or procedures; expressing *his own* ideas, giving *his own* explanation, or citing an authority other than a pupil.
		6. *Giving directions.* Directions, commands, or orders to which a pupil is expected to comply.
		7. *Criticizing or justifying authority.* Statements intended to change pupil behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.
Pupil Talk	Response	8. *Pupil-talk—response.* Talk by pupils in response to teacher. Teacher initiates the contact or solicits pupil statement or structures the situation. Freedom to express own ideas is limited.
	Initiation	9. *Pupil-talk—initiation.* Talk by pupils which they initiate. Expressing own ideas; initiating a new topic; freedom to develop opinions and a line of thought, like asking thoughtful questions; going beyond the existing structure.
Silence		10. *Silence or confusion.* Pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.

*There is *no* scale implied by these numbers. Each number is classificatory; it designates a particular kind of communication event. To write these numbers down during observation is to enumerate, not to judge a position on a scale.

APPENDIX

Excerpts from Flanders, N. A. Analyzing Teaching Behavior. Reading, Massachusetts: The Addison-Wesley Publishing Company, 1970.

A GENERAL PROCEDURE FOR PROFESSIONAL SELF-DEVELOPMENT

The general procedure about to be described is very simple and contains just five steps. These steps might be followed during initial, less complicated projects, as well as later on when more complex problems and more difficult skills are investigated. As mentioned earlier, these steps are proposed for partners, even though one person or more than two could be involved. Such small action units, in turn, would be supported by study teams of four to eight persons. Plans for projects, reports of progress, and consultation about tentative conclusions would be possible topics of study group meetings. These study groups, in turn, would be supported at universities by a teaching staff and in the public schools by consultants on inservice training. Large audience meetings of all teams would be useful for original orientation, for learning skills which all participants need, and for providing support, incentive, and a "total perspective" to the activities of the individual.

Perhaps the most important question on which we have no definitive information is: When should data collecting skills be taught to college students and employed teachers who are about to embark on such a program? The teaching of these skills comes as close to a natural learning activity as any of the laboratory experiences in biological, physical, or engineering sciences. Interaction analysis, microteaching, and to a certain extent simulated skill practice can be taught and learned in the context of problem-solving with attendant excitement and interest. This would argue for mastering these skills, at least to a minimum performance, before forming action units and study teams. Professor Douglas Minnes,* University of California at Davis, said that he would "prefer to teach interaction analysis early in teacher education even if the only benefit was the efficiency of the language. But, of course, there are more benefits than just that." Which is to say that a category system permits a great deal to be communicated about teaching behavior with relatively few words, both by the trainee and the person who conducts the training. This issue will be discussed in greater detail in Chapter 11, but there is some evidence to support the notion that training in coding can and should take place prior to self-directed inquiry projects.

*Personal communication during an interview at Davis, July 1967.

FIVE STEPS* OF THE INQUIRY PROJECT

Step One. The partner asks the "teacher" to specify a pattern of *target pupil behavior* he would like to have in his class.

Step Two. The partner helps the teacher identify two or more patterns of *teaching behavior* which would complement or fit such pupil behavior in order to obtain a reasonable chain of classroom communication events.

Step Three. The partner would work with the teacher to *practice the required teaching behavior patterns* in simulated social skill training and/or microteaching. Interaction would be coded, and if the equipment was available, recorded on video tape.

Step Four. At the same time that the activities of Step Three were occurring, the partners would *design a way for testing the relationships* which are presumed to exist between the target pupil behavior and the complementary teaching behavior. With two alternative teaching patterns, this test can compare one pattern with the other to see which was more effective under regular classroom conditions. The partner, of course, would help to collect the necessary data and might be called the "observer-helper."

Step Five. *The plan is carried out* in a regular classroom. During the analysis of the data, the first check would probably be to see if the desired target pupil behavior did in fact occur. Similar analyses would be made to see if the teaching patterns were present. The *results would be discussed thoughtfully* in terms of the relationships between teaching and pupil reactions which were presumed to exist. As unanswered questions arise, plans for testing them through further empirical exploration are considered.

Each of these steps is now discussed in greater detail.

Specifying the target pupil behavior—step one

It appears to be a little easier for all concerned* when the early projects start by talking about pupil behavior rather than teaching behavior. A teacher acts in order to produce desired effects and to start with the target behaviors leads naturally to a discussion of teaching strategies and teaching behavior.

In a well-organized curriculum for college students, the initial explorations might be determined by an instructor or some resource materials, but after a few initial experiences, the opportunity to design inquiry cycles without the

*The author is indebted to Dr. Lilburn Hoehn and members of the Michigan-Ohio Regional Education Laboratory (MOREL) for the opportunity of discussing these five steps, 1968.

*Based on the 1968 experience of the MOREL program team.

restrictive suggestions would permit the college student to experience more independent self-development. The same need for initial guidance and increasing independence is probably present in the continuing education of employed teachers.

The target pupil behaviors first suggested for an inquiry project are often too complex for the skills and resources of the teacher in training, and this provides a special function for the partner. He can help by asking the teacher to identify not one, but perhaps a half-dozen target pupil behaviors that are of interest. These initial suggestions will probably vary widely in terms of vagueness, a potential relationship to teaching behavior, and the possibilities for specifying overt pupil behavior. The partner helps the teacher become more and more precise in identifying the behavioral characteristics involved. For example, a teacher might say he would like to have his pupils become more interested in school-work. The partner can ask what the teacher means. In the give and take of conversation, a sequence of concepts showing increased behavioral specificity is identified, starting from more pupil interest, to actively participating, to pupils making their own suggestions (or alternatively, to a higher percentage of pupils talking), to the pupils expressing their own opinions, facts, and conclusions. It is the responsibility of this partnership to arrive at a behavioral meaning that is so clear that the target behavior can be easily identified and coded.

We might note, just in passing, that when both partners are fluent in the three "languages" of behavioral English, observation code patterns, and display formats (see Chapter 4) the planning and execution of these investigations are likely to be much faster and probably more effective due to more powerful inquiry skills. In any case, there are distinct advantages to having the languages and concepts of interaction analysis as early as possible.

The two partners together develop the behavioral meaning of three or four of the target pupil behaviors. *One* is finally selected after talking about the consequences in terms of the activities to follow in steps three, four, and five. Actually, steps one and two are intermixed during the initial phases of planning as we shall see in a moment.

Specifying the complementary teaching behaviors—step two

As soon as either partner asks how a teacher might facilitate the target pupil behaviors, the planning conversation has moved into step two. The dialogue between a teacher and his associate is not always orderly, so that complementary teaching behavior may be discussed before the behavioral meaning of the target pupil behavior has been made clear. Working back and forth between pupil and teaching behavior and then gradually working on the behavioral meaning of both is quite natural. In this way steps one and two are quite often discussed together.

Perhaps the most important function of the partner is to ask the teacher, "Why do you think so?" whenever relationships between pupil behavior and teaching behavior are suggested. Other helpful questions are "Give me an example" or "Let's go over that one step at a time." It is in this fashion that principles of teaching are created in a tentative form, a form that lends itself to investigation.

One purpose of step two is to identify several alternative teaching patterns which would presumably facilitate a particular target pupil behavior. There are several advantages to having alternatives, but perhaps the most important is that they provide greater freedom in reaching the most effective design of the inquiry. Perhaps an example will help to illustrate.

Suppose the teacher proposes that the target behavior is to have pupils contribute their own ideas and conclusions more often during classroom discussion. Both partners then offer suggestions about how a teacher might facilitate such behavior. A number of proposals are made: (a) asking broad questions, (b) merely asking "why?" more often, (c) increase the proportion of Category 3—accepting and making use of ideas expressed by pupils, (d) making use of the special case of Category 3 in which one pupil's ideas are consciously compared with ideas another pupil has expressed, (e) restricting the kind of information (Category 5) which the teacher is allowed to express when pupils are confronted with a problem, and (f) any of a number of more cognitively oriented strategies involving shifting the level of abstraction. These are all features of teaching behavior which can be controlled. Each might facilitate the target pupil behavior, but one or another may be most effective and appropriate in a particular setting. Identifying several target pupil behaviors and then suggesting several alternative patterns of teaching behavior for each target pattern helps by providing more alternatives for Step Four when the procedure is designed.

Sometimes a teacher feels uncomfortable about analyzing his own behavior and will unconsciously reflect this by proposing ways to facilitate the target behavior that are not directly concerned with teaching behavior: for example, the pupils will become more interested if we use different instructional materials. The investigation of this relationship might not involve analyzing teaching actions during class discussion. Another symptom of this concern is to propose that a target behavior can be facilitated by grouping pupils differently, changing seating arrangements, or making use of periods of self-directed activity. With patient questions, the teacher's partner can try to discover whether or not a teacher is ready to study his own interaction. The problem is less awkward when there are several alternatives among target behaviors and in addition, among the suggestions for facilitating each target behavior. In the long run, the best way to help a teacher study his own behavior may be to work through the first investigation on whatever terms the teacher finds acceptable.

The ideal outcomes of steps one and two include (a) having several alternative target pupil behaviors, (b) having several suggestions for facilitating each target behavior that involves teaching behavior, and (c) having several possible settings in mind in which a single relationship between teaching behavior and pupil behavior might be tested. When a teacher is hard pressed to make choices among these alternatives because he is really interested in several, the seeds for the next investigation have already been sown and a step toward continuing self-development has been taken.

Practicing teaching patterns and skills—step three

Awareness of a particular teaching pattern during the discussion of steps one and two does not necessarily ensure that the teacher is prepared to produce the pattern while teaching in the classroom. Practice in producing particular patterns is especially helpful for the inexperienced and the unsure; it improves the quality of the investigation by sharpening the teaching patterns to be compared.

Practice can take place with adults using simulated social skill practice or with pupils in a microteaching clinic. Video playback may not be essential, but some kind of "instant" feedback is necessary to assess behavior. If two patterns of teaching behavior were selected in steps one and two, these two patterns should be consistently performed yet different in character in order to set up a logical contrast which is the product of step four. It is for this reason that steps three and four can take place simultaneously; in fact, one of the best places to carry out the planning of step four is in an active microteaching clinic. During these sessions, the teacher practices and purifies the patterns of teaching behavior which are to be investigated.

Besides the teacher, the partner may need practice in collecting data. The development of convictions from personal experience is facilitated by analyzing data. These data need to be as reliable and objective as possible. The teacher's partner may need practice in coding the relevant behaviors just as the teacher may want to practice performing them. In fact, it is quite possible that the observer is more in need of training than the teacher. Not only is there need to practice using certain categories accurately, but there is often a need to make decisions about the display format. This is particularly true when category subscripts are used or when multiple coding with category clusters is used. Observation training should be continued until the particular pattern of interaction being investigated can be coded with reasonable accuracy.

Progress in self-development depends on feeding back information to the teacher-actor which reflects what actually happened, which shows that certain behaviors did or did not occur, and whether certain predicted relationships are to be accepted or rejected. *The observer, therefore, always codes the behavior patterns that occurred and must carefully guard against recording patterns merely because they were anticipated.* To provide false information is much worse than a waste of time: it leads to invalid conclusions about principles of teaching and to incorrect conclusions about the teacher's progress.

There may be resistance to practice on the part of a self-confident college student or an experienced teacher who feels that it is a waste of time. After social skill practice, I have heard teachers say, "I already use that pattern in my class," or college students say, "I know about that already." This reaction is difficult to understand especially when it refers to certain skills that are known to be of very low incidence in classroom interaction. Those who have these reactions are either unusually gifted teachers or they misjudge the quality of their total patterns while teaching.

Under the best of conditions, step three helps to solve several problems simultaneously. First, a teacher can practice a particular pattern under ideal feedback conditions, notice any improvement in his performance on teach-reteach cycles, develop more suitable lesson plans and subject matter topics, and sharpen the differences between two settings or two patterns that are to be compared. Meanwhile, the observer can become more proficient in coding, particularly if special coding procedures are required, and can settle problems concerned with the display of the data.

Designing a plan of inquiry—step four

Knowledge and skill in teaching can come from accidental insights, but it is more likely to be the product of planned inquiry. Plans for inquiry are made primarily to achieve efficiency, to obtain the maximum insight per unit of energy expended, and to make sure the activities match the interests and abilities of the participants. Inquiry need not be formal, in the sense of precise research, instead, it can be conducted at whatever level of care and logic that can be mustered. Inquiry skills result from experience. To begin is to start experiencing.

The quality of inquiry is greatly influenced by how cleverly *comparisons* are built into the analysis of results. A teacher, for example, may be interested in higher motivation. The behavioral meaning of motivation is that pupils know the first steps of a learning task, find the purposes and activities attractive, and tend to persist in work, once it is started. The question to be investigated may be to decide if motivation is higher when (a) the objectives and procedures for reaching them are first stated clearly by the teacher and then followed by questions from the pupils, versus (b) using general questions first, then shifting to more narrow questions, and ending with a clear statement of the objective and procedures. The way to find out is to conduct inquiry. Plans are made to practice introductions in a microteaching session, learn how the relevant interaction is to be coded and displayed, design some simple observations about pupil persistance, and perhaps some short questions to which pupils can mark their interest in the work. The data are collected and analyzed, and the results are

compared with ideas which can be found in books and with the opinions of colleagues which are expressed in thoughtful conversations.

The by-products of these activities may be as important as the immediate results. A teacher will have designed and then tried to implement a strategy which calls for self-control in asking and sequencing questions. A partner learns skills of data collecting. They both may learn that some unanticipated factor turned out to be more important and that the design did not permit logical conclusions. No matter how it turns out, the activities comprise professional inquiry into interaction events.

Perhaps the biggest difficulty in self-directed inquiry is that college students and teachers alike often expect to be told how best to teach. A frequent request from many sincere teachers and students is to be taught how to do something by a person who is qualified to give the advice and instruction. The "expert" is asked to come by and see if "I'm doing it right." Value judgments of right and wrong are very pervasive and can dominate the development of skills. Whenever inquiry designs fail to provide for interesting comparisons and only one set of events is in focus, then no logical plan guides the analysis. The questions most likely to be asked are, "Was it satisfactory?" "What did you think of it?" "Was it all right?" Our long adherence to the apprentice system in education has left us with a legacy of high dependency when a subordinate works with a superior. Our nearly universal desire to maintain this dependency is not very well hidden by the old adage—say something nice first before you make critical suggestions, a psychology that is probably more deluding to the supervison than it is to the teacher. It is hardly a surprise when teachers carry this same emphasis on value judgments into the classroom in their work with pupils.

There is a problem of efficiency, of course, when one sets out to discover an insight, compared with simply asking an expert. Some educators believe that experienced teachers, research workers, and knowledgeable persons can save precious time and energy by simply providing their advice. The position taken here is that most inquiry experiences can be organized so that each generation of new teachers builds on the knowledge already available rather than starting from scratch and still preserve the learner's right to rediscover.

At this point it can be said that step four, intermixed with step three, has as its purpose the design of a creative plan of inquiry which strikes at the heart of a problem. Many features of this design were illustrated in the discussion of subscripting categories, to be found in Chapter 5. In brief, a logical comparison is created to test the consequences of two different interaction patterns. Certain target pupil behaviors are identified, complementary teaching behaviors which facilitate pupil behavior are suggested, and the plan of inquiry is designed to provide information which can be the basis for forming judgments about the relationships being investigated. Perhaps more important, the participants have the experience of attempting to develop and control particular patterns of teaching behavior, to conduct inquiry about teaching, and to develop attitudes which are associated with independence while learning.

Collecting and analyzing the data—step five

Once the plans are completed and all preparations made, the teacher and his partner carry out the inquiry in the classroom. Interaction analysis data and perhaps information from the pupils' point of view are collected and arranged for analysis.

The analysis can begin with the basic questions identified in steps one and two. Did the target pupil behavior occur? What is the evidence? Did the complementary teaching behavior occur? What is the evidence? Can any inferences be drawn from the comparisons which were built into the design? For example, was there a higher incidence of the target pupil behavior when one or another kind of teaching behavior was present?

Perhaps the best reason for suggesting that two or more persons conduct inquiry together is that each person can help the other clarify the more subjective aspects of the experience. Besides attending to the cognitive problem of analyzing teacher-pupil interaction, step five provides an opportunity to identify and discuss how the teacher felt about his teaching role, how the partner assisted the teacher in gaining self-insight, how the *process* of this kind of working relationship might be improved, and similar matters. In the same sense that a teacher seeks to be somewhat self-conscious about his own actions so that his self-control in the classroom has a professional orientation, the partnership in the conduct of inquiry exists to add perspective to the subjective elements of self-development. One way to facilitate this aspect of conducting inquiry is to set aside time near the end of step five to recapture feelings and perceptions, to discuss and explore their meaning, and to interpret them in terms of what was or was not accomplished. The *process* of self-development can also be an object of inquiry!

SUMMARIZING THE STEPS OF A CYCLE OF SELF-DEVELOPMENT

These five steps of inquiry into teaching behavior represent a cycle that can be repeated. Initial efforts may be very informal, perhaps unsuccessful, and limited by the experience and skill of the participants. In subsequent cycles the quality of the experience should improve. One begins, however, by trying. The objectives are increased skill in the control of teaching behavior, increased knowledge about teacher-pupil interaction, and strengthened attitudes and convictions about independence and self-direction during learning.

CURRICULUM ELEMENTS FOR PROFESSIONAL SELF-DEVELOPMENT

Perhaps the best curriculum for learning anything is one which is custom built for the person who carries out the learning activities. It is here that the maturity of an adult and his potential for self-direction are advantages. Rather than use this maturity as a rationalization for lecturing, the teacher-educator can demonstrate his confidence in it by creating opportunities in which judgments about what to study next are made by the learner, especially after the initial self-development experiences. The guidance function of the teacher-educator can be expressed in providing alternatives, giving suggestions based on experience, and supporting inquiry projects by directing the training which the observation and data collecting skills require.

Three levels of teaching patterns were mentioned in Chapter 1, consisting of level one—lecture, narrow questions, and giving directions; level two—responding to pupil ideas and asking a wider variety of questions; and level three—using patterns of more advanced social and cognitive teaching skills and making use of models for longer range teaching strategies. It would be unfortunate if this division and the numbering of three levels led to the conclusion that self-development starts at level one and proceeds upward. Although level one patterns predominate in current, average classroom interaction, they are not necessarily the best point at which to begin the analysis and improvement of teaching behavior. It can be recommended that the study of level two patterns has the advantage of using the less complex FIAC system, centers on teaching problems which the participant is more likely to find challenging, but lies within the participant's reach in terms of the skills that are required for investigating the problems.

LEVEL ONE PATTERNS

Level one patterns are concerned primarily with subject matter content and with learning activities which the teacher initiates, directs, and actively supervises. The dominant role of the teacher is characterized by high participation while the pupils are either passive or respond when asked. Most adults already know and seem prepared to perform the teaching behavior which is a part of this level, but as the discussion of level three will reveal, improvement at level one is very urgent and most difficult. As a result, level one patterns are simply described in this section. A discussion of possible self-improvement projects is delayed until level three is discussed.

The lecture pattern

The lecture pattern with narrow questions is illustrated in Fig. 9–1. This pattern might deal only with the subject matter content or it might be concerned with

Fig. 9–1. Time Line Display of Lecture with Narrow Questions*

a topic such as how the class is to be organized in order to accomplish its work. In this pattern it is presumably appropriate for the teacher to be the major spokesman and he checks pupil understanding by asking specific questions from time to time. It is the pupils' responsibility to listen and to provide answers when asked. The structure is created and expedited by the teacher.

The most constructive use of this pattern is likely to occur when the learning goals are clear and attractive, when most of the pupils need the information which is provided by teacher lecture and look forward eagerly to hearing it, when what is said by the teacher is of high quality, and when the information is being applied by pupils in some kind of problem-solving activity before and after the lecture period.

The least constructive use of this pattern occurs when it predominates nearly all total class discussions, is sustained throughout the school day, week, or year, and is not intermixed with situations in which pupils can express their own ideas and opinions.

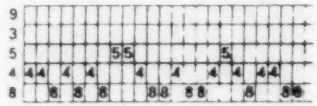


Fig. 9–2. Time Line Display of Drill and Review.

The drill-review pattern

The drill-review pattern is illustrated in Fig. 9–2. This pattern, like the one above, might be devoted to subject matter content or to the directions which have been given with regard to some class learning activities. The interchange consists of fairly short, narrow questions by the teacher and equally short and rapid answers by the pupils. This drill pattern was discussed in some detail in the first part of Chapter 4.

The most constructive use of this pattern is likely to occur when the pupils understand the purpose of either drill or review, when a game or fun format creates excitement, and when no pupil is made to feel embarrassed

*See pp. 161–68 for a discussion of time line displays using the 10-category system.

because of his ability. It is this pattern that most closely approaches the more simple forms of programmed learning materials. It is, therefore, a teaching function which is most likely to be replaced by some form of automation.

The pattern is used least constructively when the opposite conditions prevail, that is, pupils are uninterested, do not understand why they should participate, and when competition is unnecessarily vicious, hurting those who are least able and who are probably most in need of support.

The giving assignments pattern

The giving of assignments fits a pattern which is illustrated in Fig. 9–3. The teacher gives directions and makes assignments in the belief that the pupils will comply. When used properly, it is considered to be a legitimate use of teacher power and authority. The pattern appears as directions or commands which most often determine the kinds of group work, seatwork, and homework which the pupils carry out. The pattern occurs with relatively low incidence except when directions are vague or inappropriate; in which case, they often have to be repeated.

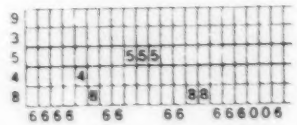


Fig. 9–3. Time Line Display of Assigning Class Work.

This pattern is used most constructively after some kind of teacher-pupil planning or developmental orientation has created positive anticipation and an acceptable context for the work from the pupils' point of view. This understanding not only includes the nature of the work involved, but is extended to reasons why the teacher chose to initiate the directive rather than arrive at agreements which the pupils see as next steps.

This pattern is used least constructively when it represents an arbitrary use of power, is connected with punishment, and involves work which is not suitable to the abilities and interests of the pupils. A condition that always occurs when the same assignment is given to the entire class.

Summary of level one patterns

One reason that level one patterns have not been the target of programs to improve classroom interaction on any widespread basis is the lack of practical category systems for analyzing the teacher soliloquies which we call "lecture."

The difficulties were made all the more apparent by Smith's (90) scholarly, extensive, and basic investigations of logical thought processes in the classroom. It seems very unlikely that teachers can make direct use of these existing systems for live observation without modification although reading reports of such investigations would be well worthwhile. Ways around these difficult problems are not yet available, but promising projects are under way.

Meanwhile, there are educators who prefer to view level one problems in terms of teacher domination, rigid patterns which suppress pupil independence, and lack of pupil initiated participation. Those who prefer this point of view can find useful suggestions in the next section where level two is discussed.

LEVEL TWO PATTERNS

Level two patterns appear at those moments when a teacher chooses to extend opportunities to pupils for more self-direction and self-expression. For these patterns to be authentic, the invitation to participate is extended in a way that it can be accepted and acted upon. That is, judging whether these patterns are present or absent depends not only on what a teacher does, but also on how pupils respond.

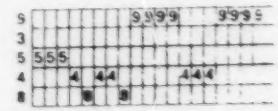


Fig. 9–4. Time Line Display of Open Questions.

Open questions

One way to loosen up a rigid pattern of interaction providing this is to be the teacher rather than a pupil prerogative, is to ask questions which invite participation by the pupils. Questions can be very narrow and restrictive; on the other hand they can be very open. The latter offer the respondent alternatives. Perhaps the most open question is, "Would anyone care to add anything?" When the invitation is authentic, any kind of comment is logically acceptable.

The pattern of open questions is illustrated by the 4–9 and 4–8–9–9 transitions in Fig. 9–4. These questions stimulate pupils to express their own ideas and to contribute their own suggestions.

This kind of pattern is most effective when seeking to lift the level of abstraction in order to set an issue in a broader context, when the opinions and reactions

of pupils are solicited during the planning or work, and when speculation and explanation is to come from the pupils.

These patterns are least effective when the details, specific facts, and particular steps of problem-solving are to be designated by the teacher. In "show and tell" or "current events" or "casual conversation about what happened yesterday" pupil talk can be encouraged by open questions, but these questions alone fail to provide logical structure, clarify the meaning of terms, and fail to move the discussion from one logical phase to another. Their *exclusive* use means that the teacher is withdrawing his guidance and influence in the control of thought processes.

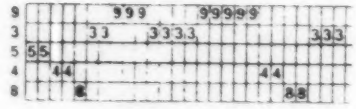


Fig. 9–5. Time Line Display of Developing Pupil Ideas.

Developing pupil ideas

A teacher can react to the ideas pupils express by acknowledging, clarifying, and using them in the problem-solving process. This pattern is the straightforward Category 3 and is illustrated in Fig. 9–5. The use of Category 3 was the topic of an analysis problem which began in Chapter 5, and ways to make use of this pattern were discussed in detail on pp. 42, 94, and 127. It might be wise to review these pages at this time. The use of this category involves several skills and it is for this reason that it might be subscripted in more advanced inquiry projects.

The use of this pattern is most effective when a teacher wants to support and reinforce pupil participation, when the ideas expressed by pupils are to be selectively developed during problem-solving, and when a shift from teacher initiated structure to pupil initiation is about to take place. The simple coding system of Categories 3 and 9 is limited and the full development of the skills of making use of ideas expressed by pupils requires more subtle distinctions and more advanced teacher inquiry projects. These are discussed in the section devoted to level three.

This pattern is least effective when the teacher wishes to guide class discussion more actively, rather than less. There are times when he wishes to express his own opinions and ideas, give directions, and take a more active part. There are also moments of readiness when pupils request or in some way need specific information or when pupils solicit a particular action from a teacher. On such occasions this pattern should either be modified or not used.

The skills involved in making use of pupils ideas are, in general, underdeveloped, in what might be called average teaching. However, the commitment to understanding the pupil and making use of his ideas is usually highly valued by the average teacher. The result is that *this particular pattern is a good point of entry into the analysis of classroom interaction and in helping start a teacher or college student along the path of inquiring into his own teaching behavior.*

"Because" extensions

Perhaps the single most important word in a teacher's lexicon is "because." There are several reasons for this assertion, and considering some examples may help to make them clear. In the examples, notice that the word "because" may not be used literally, but is implied by a "because clause." It is also possible to see that both a dimension of logic and a dimension of reasonableness appear to differentiate the contrasting examples. The logical dimension is discussed separately in a later section.

Praise extension. There is quite a difference between looking over the shoulder of a pupil at work and saying, "That's a good job, Mary," compared with, "That's a good job, Mary, because you are following the form we discussed earlier," or "That's a good job! Notice how vivid your opening sentence is!" The distinction is that in the first statement no criteria about praise were made public and, to judge only from the teacher's statement, the pupil can conclude only that when he is lucky, the teacher gives praise. This kind of reinforcement does not provide clues for future decisions about behaving. It enhances the authority of the teacher, makes his use of this authority capricious, and sometimes interrupts the train of thought of the pupil. Praise without explanation or when given inappropriately led Farson (29) to suggest that praise does not motivate—it may more often threaten rather than reassure a person of his worth—it establishes the superiority of the praiser, and praise may constrict creativity rather than free it. There is much food for thought in the analysis of teacher praise, especially when the reinforcement to pupils may be more effectively given in terms of Categories 1 and 3.

No diagram of extended praise is shown here in order to illustrate a time line display because extended praise appears simply as *more than one* 2 unless some system of subscripting is used. The self-development goal which might be investigated is to reduce the randomness in the incidence of Category 2 and extend a series of 2's whenever praise is given by always clarifying the criteria which makes something praiseworthy. Asking pupils to participate in providing praise is an interesting and worthwhile variation, especially when the pupil explains "why."

Criticism extensions. Many of the comments made about praise can also be made about criticism. It is one thing to say, "Stop talking!" in an angry fashion and

quite another to discuss either rules of conduct that were agreed to earlier or the tasks at hand and how they would be affected by unnecessary talk. Criticism can also be made more effective by at least acknowledging its causes; this can sometimes be done so effectively that it might not be properly coded with Category 7. For example, "Jimmy, you are so enthusiastic and eager to talk that you sometimes forget and interrupt others," is a statement that would be coded with a 1–7 transition, and under certain circumstances and tone of voice, as a 1–1.

The time line pattern of extended constructive criticism usually involves code numbers other than 7, such as 1–1–7–7, or 7–3–3–7, and similar sequences except when subscripts are used.

Extending directions. Providing reasons for a direction softens the arbitrary use of authority. For example, there is quite a difference between "Please open your books to page 67" and the same direction with the explanation, "Please open your books to page 67 so we can find out how the author describes that part of South America." Extensions of this sort are oriented to a purpose in problem-solving and frequently are concerned with subject matter. It is also possible for extensions to explain why a teacher decides to use his authority, for example, a teacher might say, "Put away your books and materials, boys and girls," or he can say, "Look at the time! We have only a few minutes to clean up before the recess bell."

The time line display models for the extensions of directions would require subscripting, given the basic 10-category system. A series of 6's or shifts from Category 6 to some other category do not provide the information needed. Multiple coding with category clusters can be recommended for this kind of analysis.

Summary of level two patterns

All level two patterns either tend to invite more active pupil participation or tend to soften the use of teacher authority by making it more reasonable, understandable, and less arbitrary. The rationale by which a movement from level one to level two can be considered to be an improvement in instruction runs along the following lines.

While the main business of learning is concerned with subject matter—the knowledge, skills, and attitudes associated with it—*how* the teacher controls the learning activities and manages his own interaction establishes a common expectation among the pupils in spite of their individual differences or differences between classes. These expectations that are held in common have been called "classroom climate" in earlier studies (41) and can be measured by pupil attitude inventories. In groups of comparable classes (e.g., same age level, subject matter, and hopefully of about the same ability) classrooms with higher average class scores on such an attitude inventory are more likely to average around 15 percent level two patterns while classes scoring significantly lower average attitude scores would involve about one-half or 7½ to 8 percent level two, based on teacher talk only.

What needs to be emphasized is that a relatively small increase in level two patterns, from 7½ percent to 15 percent, seems to be associated with more positive pupil attitudes. About the only conclusion from these comparisons that seems warranted from our present knowledge is that a teacher who seeks to move from level one to level two, given our present classroom practices, is attempting to make a small increase in patterns which invite more active pupil participation and tend to soften the use of teacher authority. Yet in *both* high and low attitude classrooms, level one patterns predominate, easily exceeding more than one-half of the interaction.

A second point to emphasize is that any teacher or college student who sets out to alter the balance between level one and level two patterns of classroom interaction, *in the same classroom with the same pupils*, expecting to produce more positive pupil attitudes, is proceeding into unknown territory insofar as our present knowledge is concerned. We do not have objective evidence to show that a teacher can expect to alter pupil attitudes simply by shifting this balance, even though there is a good possibility that this can be done. However, this absence of evidence should make the prospects of the inquiry more rewarding, not less, provided, of course, that there is a genuine spirit of adventure.

Keeping the two foregoing limitations in mind, one might risk experimenting with his own patterns of classroom interaction by attempting to increase the incidence of level two patterns. It would seem reasonable that such a program of self-development might involve finding "safe" settings in which a teacher can practice asking more open questions, clarifying and making use of ideas expressed by pupils, and learning how to extend praise, criticism, and directions during spontaneous interactions with pupils. He then might consider which classroom situations would be most appropriate for trying out these new patterns. Finally, he might try to introduce them into his own classroom with his own pupils. If he has a partner in inquiry and a plan of self-development, he may be in a position to decide for himself whether or not such shifts in classroom interaction patterns do or do not have a perceptible effect on the reactions of pupils.

LEVEL THREE PATTERNS

Level three patterns of classroom interaction can be distinguished from those in the two lower levels because they are more complex. Level three patterns are more complex because the affective and cognitive components of the interaction require some kind of synthesis in order to reach improvements. It is the purpose of this section to clarify what is meant by the affective and the cognitive components of instructional problems by giving examples of inquiry projects.

by showing the kinds of interaction analysis data that can be collected, and by suggesting relationships between teaching behavior and pupil behavior that can be investigated.

Independent pupil behavior in the classroom

In our culture, classroom behavior practically invites the interpretation that all pupils and students from kindergarten through graduate school possess a built-in dependence on the authority of the instructor. The maturity and power advantages of a teacher, reinforced by social expectations, are such that the pupil anticipates teacher direction and supervision. Most pupils and students expect to comply to teacher directions, a few expect to resist, and still fewer are indifferent, depending on their past experiences with other authority figures. Pupil self-direction, independence, and initiative are features of learning behavior which run counter to the prevailing patterns of dependency.

When a pupil does what he is asked to do, such as to open a book or close a door upon request, this is an act of compliance. There is a great deal of conditioning along these lines in the life experience of young people, starting with parents and continuing with teachers. This kind of behavior is considered highly desirable by most adults since compliance to the laws of society and conformity to social customs are considered necessary. This pattern of growth presents difficulties to a teacher who would like his pupils to respond to the objective requirements of a problem in creative and independent ways. It is time to question the extent of pupil conformity and compliance which exists in our classrooms. In particular, it is time to investigate how different degrees of compliance match optimum growth toward different educational objectives, to learn how to recognize excessive compliance, and to do more than just speculate about the consequences of maintaining present levels of compliance from one year to the next, throughout the school experience.

One way to describe teaching is to say that the teacher strives to change response patterns of a pupil from mere compliance to more appropriate independent action which is determined by the pupil's own analysis of the problems he confronts. Skillful teaching helps pupils learn to accept responsibility for their own actions. The goal is to have pupils learn to identify problems rather than have them "given," to analyze the problem and plan a tentative course of action rather than follow "a recipe," to carry out the plan with some feelings of responsibility rather than just "follow directions from the teacher or a book," and then to consider the results with some degree of personal judgment rather than "asking the teacher if it is satisfactory." In short, the goal is to help pupils conduct inquiry in a way that is similar to the inquiry being advocated for the self-development of teachers.

At this time not very much is known about the consequences of providing more opportunities for independent and self-directed learning activities in the classroom. When can this be done? How often? How does the teacher design an organized curriculum of increasing self-direction and incorporate these plans into the classroom activities? What about pupils who are excessively dependent prone? Definitive answers to these questions are not available. A teacher who is interested in them can proceed to conduct his own inquiry, but to start he needs a target, such as—*classroom learning activities should involve as much self-direction and independence as the maturity, self-control, and self-directing skills of the pupils will allow, keeping in mind the necessity of total classroom coordination and organization.* On the pages which follow there are suggestions about inquiry projects which will help those who can accept this value.

Teacher responsiveness and pupil initiation

One way to know that you exist is to have your ideas recognized; one way to force another to question the relevance of his presence is to ignore what he says. Often the way this works out in the classroom is illustrated by the following: Teacher: "Billy, what is three times three?" Billy: "Six." Teacher: "Jimmy?" Right after Billy said "Six," he apparently disappeared! Judging by communication, Jimmy simply vanished. Teachers and college students often react to this illustration by saying, "Yes, I know that." But what teachers usually do not realize is how often something like this happens, under what circumstances it happens most often, and whether it happens more often to some pupils than to others.

The problem is not only to hear what pupils say more conscientiously and accurately, it also involves learning those skills of communication which convey to the pupils that his ideas were heard. The teaching behavior which is most likely to achieve this goal is categorized in Category 1, for feelings and in Category 3, for ideas. Successfully used, these statements help a *pupil to know* that his ideas do make a difference because they are being heard and reacted to. Under these circumstances a pupil can begin to learn that there are consequences to expressing ideas and can start practicing the responsibilities that belong to any person who expresses ideas. In the next section, subdivisions of Categories 1 and 3 are listed. This list is similar to the subdivisions made on pp. 133–36, but here the analysis is carried just a bit further.

Types of teacher response. Verbal statements about pupil feelings and ideas can be either declarative or they can be interrogatory. Both types of statements can be further subdivided according to the following scheme. The teacher can make a statement or form a question which

1) Acknowledges the idea or feeling; that is, he merely repeats the nouns and logical connectives that the pupil has just expressed or he simply identifies an expressed feeling.

2) *Modifies* the idea or feeling: that is, the pupil's ideas are rephrased by using synonyms or the pupil's feelings and actions are conceptualized by using the teacher's own words. To fit into this category, the synonyms or concepts must pass the test in which the pupil says, "Yes, that is what I meant," or "That is how I feel."

3) *Applies* the idea or feeling; that is, the teacher uses it either to reach an inference or to take the next step in a logical analysis of a problem. With feelings, he might speculate on how an attitude or feeling could influence work on a task.

4) *Compares* the idea or feeling; that is, the teacher relates what a pupil said or feelings he expressed to what the teacher thinks, to written material, or to the ideas and feelings that another pupil has expressed. In some cases a relationship can be drawn to something the same pupil said earlier.

5) *Summarizes* the ideas or feelings; that is, the teacher makes an inventory of what was said or feelings that were expressed during a preceding period of time. In this case, the activities of several pupils may be involved.

Possible inquiry projects. The above subdivisions of Categories 1 and 3, from the FIAC system, can be used to form new category subscripts. An observer can learn to record these subscripts, making special notations to indicate questions. A possible direct coding time line display, discussed in the next section, can be used with the subscripts. Here we are concerned with the possible inquiry projects which would require such categories.

The first activity would be to practice coding with the subscripts. The partners of an inquiry team could visit each other's classroom; they could jointly visit a third teacher's classroom; they could listen together to voice recordings. No matter which alternative is chosen, the purpose is to practice subscripting in a teaching situation in which the teacher is likely to make above average use of Category 3 type statements. A classroom session of drill, for example, might provide so little practice that the observation would be a waste of time.

A second activity might include some kind of exploratory microteaching. Four or five pupils could be asked to discuss a story they had just finished reading and in this setting the teacher could practice making different kinds of Category 3 statements. During these sessions, the inquiry partner could be invited to practice coding. This second step, then, would move the inquiry project toward three objectives: (a) both partners learn to perform a wider variety of Category 3 statements, (b) each partner learns to code these same statements with the subscripts, and (c) the two partners can begin to speculate about the kinds of pupil behavior which different kinds of Category 3 statements tend to support.

Now it is time to turn to the five steps of inquiry which were described on p. 273. That is, after completing the "warm-up" activities above, the partners would be in a position to identify target pupil behaviors, suggest supporting teaching patterns, and proceed to design inquiry comparisons, and so on. The nature of these projects would depend on the grade level, the interests of the partners, the time and energy available, and so on. One partner might prefer to explore the consequences of these teacher statements when above average pupils are compared with below average. In a self-contained classroom, one participant might be interested in seeing how such statements would fit into an arithmetic lesson compared with reading. At the high school level, it might be instructive to compare the effects of these statements in a class that meets during one period with a class that meets at some other period. Or the use of such statements during the introductory phases of a new unit of study might be compared with their use in the middle work period of the unit, or the terminal phases of the unit.

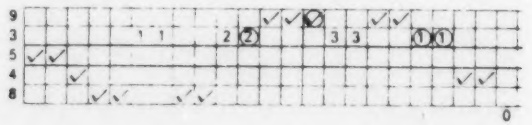


Fig 9–6. A Possible Time Line Display for Subscripting Category 3

Coding and display. A direct coding time line display like the one illustrated in Fig. 9–6 could serve for interaction segments which are 15 minutes or less in duration. Longer periods might require a histogram or expanded matrix tabulation. The coding conventions for the time line in Fig. 9–6 would be to place a check (√) in all rows except row 3. In this row the arabic numbers are used to indicate the subscript number. A circle around the symbol in rows 9, 3, and 8 would be used to indicate questions. The zero below the last column, to the right, would be used to indicate Category 10.

Collecting data from pupils. When pupils are old enough to read and fill out rating forms, data in addition to interaction analysis data can be very helpful. With very young children, it may be possible to design nonverbal checklists which pertain to such pupil reactions as being distracted, persisting in work, and so on. If the project was concerned with how Category 3 statements affected the motivation of pupils, then a little questionnaire like the one shown below could be used to gather pupil reactions. The administration time would be very short, on the order of 2 minutes. Older pupils can help tabulate the answers for the total class, displayed separately for each item. Each item shown below could be written beside a five-point scale and each pupil responds by marking

one of five points for each item. Below the 5 and the 1 at the extreme ends of the scale, key words could be written. The suggested key words are shown to the right of each item.

Sample Pupil Questionnaire

Item		Five-Point Scale					
1. Today's class discussion was very interesting.	all of the time	5	4	3	2	1	none of the time
2. I'm looking forward to doing the work that we planned with . . .	high interest	5	4	3	2	1	low interest
3. I know how to start my task as soon as we begin work.	very well	5	4	3	2	1	not at all
4. The teacher seemed interested in our ideas today.	all of the time	5	4	3	2	1	none of the time
5. I really liked the class discussion today.	all of the time	5	4	3	2	1	none of the time

Short questionnaires can be filled out quickly by pupils in the fourth grade or higher. Second and third grade pupils usually perform more effectively when someone reads each item and shows the pupils how to mark the answer of their choice with an illustration on the blackboard. Pupil rating scales of this sort are of value only when two class sessions are to be compared. A single administration provides no basis for interpretation.

Asking questions to stimulate pupil initiative

All teachers ask questions. For some, this is a highly developed skill which provides pupils with a genuine opportunity to express initiative. A few teachers use questions to establish and maintain control. Questions can be cruel and vicious, routine and boring, or the basis of exciting inquiry. Most teacher questions are perceived as acts of initiation by pupils who must answer. Questions can easily reinforce superior-subordinate relationships with at least overtones of "expertness" or greater maturity.

The expected response to a question is an answer. In our society, however, an unanswered *pupil* question is an accident or planned indifference, but an unanswered *teacher* question can easily be impudence and sometimes may even be considered a crime.

Improvement in asking questions may fit into one of three conditions: first, questions are now asked that were previously ignored; second, questions are formulated and then arranged into sequences which are more effective in terms of the teacher's purpose; and third, the quantity and pacing of questions are altered in order to become more consistent with some model of teaching behavior. An example of the first two now follows.

Questions frequently ignored. Most teachers can double or triple the number of questions asked about attitudes, feelings, and perceptions which pupils have *at the moment*—not to be confused with questions about how a pupil felt during some past experience—and still not come close to 1 percent of all questions asked.* Since a teacher is not a therapist, the value of such a change in teaching behavior can be questioned. There are, however, appropriate circumstances for such questions in the classroom. Two illustrations are discussed below.

First, a teacher can learn how to deal constructively and realistically with negative feelings which develop when a learning task is blocked or is not progressing satisfactorily. Carefully chosen questions can help a pupil get back on the track more efficiently by attending to feelings first and then dealing with the cognitive aspects of the problem second. This was done rather bluntly once when one pupil asked another, during a group-work committee meeting, "Well, how do you expect to get anything done if you feel *that* way about it?" The teacher who can ask a youngster with genuine concern and with not even a trace of malice, "Do you feel upset?", "Are you bored?", etc. and then says, "Maybe it would help if you told me about it," can help "open up" communication so that emotional difficulties can be taken into consideration. In these instances, it is the teacher who makes a judgment about whether stopping work on arithmetic, in order to discuss feelings about arithmetic, is or is not the most promising approach. In most classrooms, the judgment is usually against opening up communication to include feelings, or at best the teacher expresses an optimistic "flight" statement away from feelings by asserting, "I'm sure you'll get through, cheer up."

Second, a teacher who can identify and support positive feelings of enthusiasm and excitement when learning tasks are being planned may be able to mobilize much more energy than teachers who ignore this aspect of planning work. The identifying requires questions, or at least neutral statements about feelings which elicit responses, and once attitudes and reactions have been expressed, the consequences are then discussed in terms of the learning task.

Setting up microteaching practice and classroom applications of questions which deal with feelings and attitudes sometimes becomes less authentic because it may be necessary for the teacher to role play feelings when the situation makes it awkward. Nevertheless, a coding system for observing patterns

*Such a question would be coded in Category 1 and the incidence of all Category 1 statements is below 0.5 percent in the average classroom over an extended period of observation. Call the statement an informed guess, since the data are not available.

of this type can be improvised from the basic 10-category system almost on the spur of the moment. For example, a "+" sign can be used to indicate positive feelings. A "−" sign can be used for negative feelings. Either symbol could indicate the quality of feelings expressed by pupils, or it could indicate the teacher's reaction to a pupil. The addition of an "=" sign for neutrality, and a "?" sign for a question are other alternatives. Figure 9–7 provides an example.

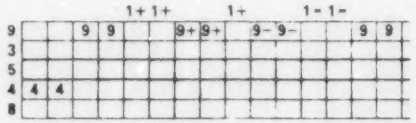


Fig. 9–7. Time Line Display of Feeling Questions.

Formulating, arranging, and sequencing questions about feelings. Suppose that an inquiry project is designed to go beyond the mere identification of positive, neutral, and negative feeling tones. Two partners in inquiry may wish to investigate how a model of inductive reasoning might be applied to diagnose feelings. This will involve asking questions to identify and clarify feelings. When the purpose is to deal realistically with the consequences of these feelings, several logical steps are often helpful, steps that are similar to those which Taba (99) proposed for inductive thinking. For example, the teacher can ask, "You seem upset, Jimmy. Can you tell me how you really feel about this?" The purpose here is to help the pupil identify his feelings and this usually requires several questions and several answers. This first step produces a list, or more formally, an inventory of present perceptions. Following Taba, these can be grouped, given labels, and then any discussion of consequences would produce functional relationships constructed out of the labels. To illustrate, suppose the pupil's responses and clarifications can be characterized as "angry at himself," "dislikes the task," "so upset he can't think," and these might be well laced with rationalizations such as "I'm no good at this" and "it isn't worth doing." Statements such as these can be grouped into clusters that refer to the difficulty of the task, the inability to proceed, how one feels about this, and what can be done about it. The functional relationships are of the sort—"when I can't proceed with a difficult task, it makes me angry," or "I would feel better if I could figure out what to do next." The purpose of helping a pupil formulate such functional relationships is to help him use his negative feelings as a stimulus for constructive plans and subsequent action. The purpose of teachers who are in training is to conceptualize the inductive model, associate appropriate questions with each logical step, plan a sequence for these steps,

TABLE 9–1
Categories for Classifying Questions About Affect

Logical Process	Intended Openness of Alternatives		
	Only one	Two or three	Open
Citing present feelings, attitudes, and perceptions	11	12	13
Grouping, conceptualizing, and naming emotional or attitudinal states	21	22	23
Applying, comparing, interpreting, and explaining relationships among conceptualized states	31	32	33
Making generalizations, predictions, reaching conclusions, synthesizing about consequences	41	42	43

Examples:

11—"Are you interested in your arithmetic homework for tonight?"
12—"Do you think tonight's homework is more or less interesting than last night's?"
13—"What are your reactions to homework?"
21—"Well, if this assignment is too long and too hard, would you call it unfair?"
22—"Which assignments illustrate hard and easy homework?"
23—"Do you see any way to group these assignments in terms of your reactions?"
31—"What is a first step to take when you face an assignment that you dislike?"
32—"Do you think that your feelings help or hinder how hard you might work?"
33—"If you think an assignment is fair, but difficult, what effects might this have on your work?"
41—"What happens to 'work accomplished' when most pupils in the class really like their homework?"
42—"Which of these two conclusions do you think applies more appropriately to the pupils in our class?"
43—"Can you explain why you think that your prediction is likely to occur?"

and then practice performing and coding the interaction during the interchange.

In order to accomplish this training task, it will be necessary to design a set of categories which have both logical and affective dimensions. Next an appropriate setting for microteaching and classroom discussions will be necessary, a setting which is realistic and which will evoke authentic behavior so that a genuine expression of feeling is likely to occur. Such a setting might become available, for example, when pupils become upset about a difficult arithmetic assignment given as homework.

The categories and code symbols in Table 9–1 might be used for this training problem. The logical processes shown to the left are based on Taba's (99) steps of inductive thinking. The affective dimension, shown by the columns to the right, is based on Hughes' (55) notion of open and closed questions. A closed question to which only one response is appropriate is shown in the left column. A partially closed question which involves two or three options is shown in the center column. An open question to which any kind of response is appropriate is shown in the right column. Two digits are used for each code symbol: the first number indicates one of four levels of logical process; the second number indicates one of three degrees of openness. This gives a total of 12 categories. Questions which illustrate each of the 12 categories are listed following Table 9–1.

In a practical microteaching episode and especially in a total class discussion, it is quite likely that all 12 of the categories would apply to statements other than questions. The way that this can be handled is to consider the 12 categories (Table 9–1) to be subscript notations of the FIAC system. A form for direct time line coding could be designed which had columns spaced wide enough for two digits per column. An example is shown in Fig. 9–8. This direct coding procedure would require a rate of coding single events which undoubtedly would be slower than one tally every three seconds. With practice, a talented observer might approach one notation every five seconds. Should this estimate be optimistic and the rate for a particular observer turns out to be too slow for practical use, then another option is to collapse the 12 categories to a smaller number. One way to collapse the 12 categories into 4 which would require only a single digit symbol for each subscript is the following. Let the first category consist of 11 and 12 (Table 9–1); the second of 13 only; the third of 23, 33, and 43; and then let all the other combinations from Table 9–1 fall into a fourth category. Suppose the 12-category system was used and produced data like the configuration in Fig. 9–8. How would this display be decoded?

The pattern in Fig. 9–8 starts with the teacher expressing his opinions about a specific attitude and then shifts to a more open view (13) of the topic. This leads to an open question (13) which asks for any kind of reaction. Pupil

reactions of their own choice fall in row 9, which the teacher briefly acknowledges. Then the teacher asks a more specific question (11). The pupils' response is again acknowledged, which leads to some self-initiated additional comments by pupils. The teacher expresses his own views and then asks for any reactions (33) to the application or consequences of the attitude or feelings being discussed. There is then an open teacher question (43) soliciting level four generalizations or conclusions to which there is a pupil response.

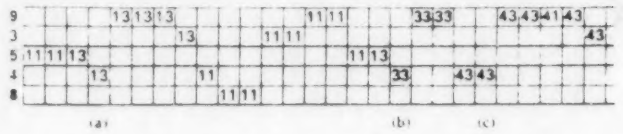


Fig. 9–8. Time Line Display of a Model for Diagnosing Process Problems.

This model has two dimensions. First, all shifts of level in the logical dimension are introduced by open rather than narrow questions; see columns a, b, and c, Fig. 9–8. Subsequent questions at the same level, which is illustrated only once after column a, may be more specific. A second dimension is shown by all first digits in the columns which proceed from 1 to 3 to 4 or from the specific to the general, moving from left to right. Alternative models can mix up these two dimensions into several combinations. Movement from left to right in the time line can be from the specific to the general or vice versa. Each phase shift can be introduced by open questions or by narrow questions. More complex models could involve three shifts in the specific to general levels. It might be argued that in diagnosing individual difficulties, to choose one example, the first questions should be open, followed by specific, ending with open, and that this sequence should be superimposed on a gradual shift from the specific, row 1 in the category arrangement, on toward the general or row 4. In terms of strategy, the teacher would begin by asking open questions so that a pupil could express his own specific attitudes. The teacher then clarifies one particular attitude (or more) and helps the pupil cite it, name it, apply it, and predict the consequences. The sequence could end at the (43) levels, when the teacher asks, "What reactions do you have about how discussions of this sort might help boys and girls who have homework?"

Some project suggestions for building pupil initiative

Although making use of pupil ideas and asking questions in order to support pupil initiative and independence have so far been discussed separately, the two go together, hand in glove. What the teacher does when a pupil stops

talking and how the teacher solicits pupils' participation are essentially parts of the same instructional problem.

One place to begin is to investigate what happens to the ideas which pupils express during classroom interaction. Are they acknowledged by the teacher? By other pupils? Are the ideas used in some constructive fashion? A next step might be to become concerned with feelings and attitudes. How can feelings be acknowledged? Can the attitudes and feelings which pupils develop about learning be used constructively? How does one decide when to take the time to confront feelings, interpret them, and relate them to the main business of learning? In what ways can feedback to pupils about attitudes and feelings be most constructive? Which patterns of teaching behavior are most effective in accomplishing a constructive use of attitudes and feelings? Throughout our concern with ideas and feelings, the function of teacher questions is a central issue. How can the range of questions be increased? Which questions serve particular purposes?

There is a strategy for sequencing questions which might be called "selective reinforcement." A teacher can ask broad, open questions about subject matter, or about plans for action, or about feelings and attitudes. By acknowledging ideas and feelings that are expressed and by encouraging other pupils to express their own point of view, many different opinions can be gathered. A teacher can focus the attention of the class along lines of thinking and feeling that he thinks will be most productive by selectively reinforcing what some pupils say. That is, when opinions or feelings are expressed which may move the discussion toward desired objectives, a teacher can ask the pupil who spoke, or some other pupil, to elaborate. By asking any number of questions such as, "Why do you think so?", "Tell me more about what you have in mind?", or "How do you see this idea fitting into our discussion?" the teacher turns the attention of the class upon a particular emphasis that the teacher has selected but a pupil has suggested. When this is done skillfully, the pupils progress in their analysis of a problem, but achieve this in such a way that their own actions and points of view are actively expressed. In this way a teacher can exert his authority and more mature judgment without unnecessary imposition and without generating unwanted, excessive dependence. Attention which is focused in this manner can proceed along lines of thought that the teacher thinks are most productive, yet the pupils will experience a sense of independence and ownership with regard to the matters under consideration.

When questions are used for selective reinforcement, there are usually predictable shifts in the concepts used. The teacher's questions and immediate acknowledgments are likely to be more abstract—in terms of generality and broadness—during the early phases of the discussion. As the conversation achieves more focus, comments and questions become more specific. At times the meaning of words is clarified, particular comparisons are made, and the

thrust of the conversation is judged in terms of the original problem. These are essentially logical procedures, even when the topic is concerned with feelings and attitudes. So let us turn to an analysis of these logical processes, discussed in terms of pupil initiative.

Level of thinking during classroom interaction

Very crude guesses about the level of thinking involved in teacher questions and lecture in an above average socio-economic, suburban school district can be made by referring to some data from a fourth-grade unit on social studies involving 16 experimental classrooms. The matrices of two classrooms within this sample are shown in Tables 5–1 and 5–2, in which Categories 41 and 51 designate questions and lecture which are restricted to facts and the more limited mental processes connected with citing facts.

The proportion of narrow questions and factual statements to all questions and all lecture teacher talk only, is an astonishing 89 percent! Apparently current teaching practices in these two classes not only involve teacher domination through teacher initiation and pupil response, but in addition, the logical quality of the verbal interchange more often consists of narrow questions and simple factual relationships. The proportion of discourse which is concerned with inductive and deductive reasoning, synthesizing, predicting, and generalizing probably reaches an incidence that is below 15 or even 10 percent during subject matter discussions.

One way to acquire at least an orientation to the concepts describing the range of thinking which might take place in the classroom is to consult Sanders' (84) adaptation of the six levels of thought developed by Bloom (13). Sanders made small modifications of the Bloom levels of thinking that can be presumed to characterize educational objectives. Sanders was interested in questions asked by teachers, primarily, and thinks that questions can be classified as (1) memory, (2) translation, (3) interpretation, (4) application, (5) analysis, (6) synthesis, and (7) evaluation. Sanders' paperback is a handy book for those who would like to start thinking about the teacher's role in the improvement of the logic of classroom discourse. It may well be that the best place to start is by increasing the kinds of questions asked, just as it was recommended earlier that the best place to start improving pupil initiative was by responding more thoughtfully to ideas expressed by pupils.

There is some evidence to suggest that an increase in the kinds of questions alone would underestimate the problems and that besides reformulating questions, practice in timing and sequencing questions is also essential to improving the logic of classroom discourse. Bellack (9, p. 212) showed that only three out of 21 possible teaching cycles in his category systems accounted for more than half of all the interaction. They were: teacher solicits and a pupil responds,

19.3 percent; teacher solicits, a pupil responds, a pupil reacts, 27.6 percent; and teacher solicits, pupil responds, a pupil reacts, a pupil reacts, 10.2 percent. These data indicate that a single idea is given a relatively "short ride" in classroom conversation before it is dropped in our eagerness to get to the next idea.

On Hilda Taba's San Francisco team, McNaughton (65) compared six experimental classes with six controls and then cross validated the study on a similar population in an effort to locate generalizations expressed by fourth, fifth, and sixth grade pupils. The experimental teachers had been trained to ask those questions which would more likely stimulate pupils' thinking and cause them to state generalizations, in contrast with a teacher making generalizations. What seemed most interesting was the difference between isolated higher level pupil statements and the same higher level pupil statements when they appeared in a more complete logical context. The *isolated* higher level pupil statements occurred at an incidence of 76 for six experimental classes and 60 for the six control classes in the cross validation study. Here there was not a large difference. But when the high level pupil statements which occurred in the context of a logical "module" were counted, the experimental class incidence was 59 while the control classes showed only five. Here the difference is large. This shows very promising results when teachers are trained to understand logical thought modules which provide a more logical context for the ideas which are being discussed.

Unfortunately we do not have enough studies to make generalizations about the quality of logic in classroom discourse. What can be said, from the studies so far reported, is that when and if a representative survey is made, we should be prepared for a devastating indictment, especially in those classrooms which are below a mythical national average with regard to logic in classroom discourse. Our uneasiness should be sharpened when we realize that about half of our youth could be found in such classrooms.

Improvement will not be easy. Surely at least these steps will be necessary. First, pupils are not likely to have opportunities for developing and practicing higher logical processes until teachers have learned the skills themselves and are in a better position to teach them. Second, something like a national convulsion may be necessary in order to free teachers from the pressure of covering facts and to slow down the tempo of instruction so that intellectual skills are more likely to grow and flourish. Third, specific strategies of teaching behavior which facilitate higher logical processes for pupils must be identified through research on what is the best teaching, not what is common practice, and teachers will need opportunities to experiment with these strategies. Fourth, given our present conditions, the initial training experiences should be rather simple, primitive, self-development projects in which the more rudimentary skills are involved. Fifth, a genuine appreciation of the problems must surely involve reformulating questions, sequencing these questions, and developing skill in patient timing, in order that most pupils, not just the brightest, can show more initiative in thinking at higher levels of logic.

Possible approaches to improved teaching patterns

In considering the speculations which follow, it would be well to remember that teachers need practice *during interaction* in order to develop useful skills for guiding thinking during classroom discourse. Lectures either at a university or in a program for employed teachers can reach only very limited objectives. The procedures already outlined which involve microteaching, simulated skill practice, and classroom practice with interaction analysis feedback are more likely to be effective, given our present knowledge. The goal is to provide opportunities for pupils to take the initiative in higher level thinking.

Asking questions. One way to start is to read pages 184 to 185 regarding Taba's steps of thinking. Questions which support these steps are:

Function	Example
Differentiating and citing	"What would happen if . . .?" "What other things might happen?"
Grouping and categorizing	"What things on the board go together?" "What else goes in this group?"
Labeling	"Who can suggest a name for all of these things?"
"Reading" points and relationships between points	"How does a *cold climate* affect building houses?" "Why do you think that would happen?"
Explanations and generalizations	"Who can put all these ideas into a single sentence which says what we mean?"

Questions of the type suggested by Taba can be open as shown above or they can be more specific in order to focus pupil observations and thinking toward particular facts or relationships. A first step in developing skill in asking questions which guide pupil thinking is to increase the repertoire of questions, to know of more kinds of questions, and to be able to ask them on the spur of the moment.

Taba's ideas also require that questions be asked in a sequence that is purposeful. In Fig. 9–9, inductive processes leading to generalizations and deductive thought processes which test generalizations are illustrated in diagramatic form. Citing instances and facts, using labels, finding relationships between points identified by conceptual labels and forming these into generalizations emphasize an inductive sequence. To start with generalizations and explore their meanings through illustrations and applications usually

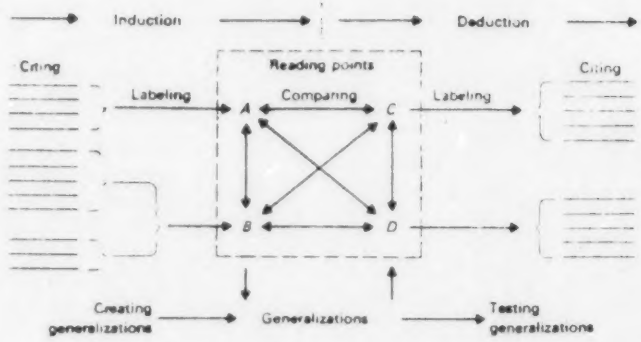


Fig. 9–9. Sequences in Logical Thought.

involves a more deductive emphasis. The teacher guides these sequences by asking questions according to a strategy.

Besides repertoire and sequence, the teacher is concerned with timing, especially when as many pupils as possible are to participate and when the pupils and not the teacher are to make generalizations, give examples, and make applications. For instance, to reach generalizations inductively, Taba (99, p. 114) recommends that a large proportion of time be spent citing ideas without moving on to grouping them so as to encourage the participation of many different pupils. This aspect of pacing requires patience and judgment about when to shift from questions which elicit "citing" to questions which stimulate "grouping" ideas. The most frequent teaching error may well occur when one or two bright pupils leap to generalizations before the rest of the class is ready and the teacher enthusiastically reinforces such behavior. The point is to teach most of the pupils to reason carefully and to protect the opportunities for practicing such skills.

Those who are seriously interested in these cognitive characteristics of classroom discussion are urged to first read the references cited and then proceed to ask how systematic observation coding systems can be used to display the processes involved. Several of the coding systems described in Chapter 6 and in the present chapter can be used to assist a teacher who wishes to practice sequence and pacing in asking questions.

In passing, a moment of consideration should be given to teachers inquiring into their own teaching patterns in ways that are consistent with how they expect to teach in the classroom. Please notice that Fig. 9–9 could also be presented as an illustration of the five steps of inquiry which have been recommended earlier for professional self-development. Citing particular pupil behaviors and citing complementary teaching behaviors are the initial steps to the left. Concepts describing both pupil and teaching behavior are labels

which refer to these behaviors. Reading points, making comparisons, and explaining then occur through data collection, feedback, and interpreting the data. This then leads to generalizations about teaching patterns and the effects of these patterns on pupil participation. Inquiry into one's own behavior can also start with a generalization and through practice and observation lead to specific applications through a process of deduction. In other words, the problems of understanding teaching strategies involve thinking processes which are very similar to the thinking processes which pupils carry out in their own intellectual growth.

Teacher lecturing. One of the few experimental studies on the effectiveness of teacher lecturing, conducted with exceptionally high standards of research design and control, has been conducted by Rosenshine (79). Variables in 21 categories were identified in one experimental group and then cross validated in two additional groups. Variables in three categories were finally identified as features of a lecture performance which distinguished those situations in which pupil comprehension and understanding was high, contrasted with situations in which these measures were low. Each of the three are briefly discussed below.

Gesture and movement to emphasize points were found to have a higher incidence when pupil comprehension was high. Such movements tend to emphasize points.

"Rule and example pattern of discourse" was also a significant predictor. This refers to the use of summary statements before and after a series of examples. Although it may be an oversimplification, this characteristic means to tell someone what you are going to tell them, then tell them, then remind them of what you said. Stating a point, illustrating it, and then restating it was the sequence which occurred with high incidence in the high scoring classes.

"Explaining links" were also higher in incidence with above average comprehension. Explaining links are such words or phrases as "because," "in order to," "if . . . then," "therefore," and so on. Such links could be labeled "logical connectives." Some are stronger and more vivid while others are weak or may be missing. Their use helps, apparently, to fix relationships in memory and may assist in giving emphasis.

There are two types of interaction analysis coding which might help in the analysis of teacher lecture. First, categories which apply to the subject matter itself can be used. For example, the topics of the lecture can be organized into a content grid or simple outline and each major division of the content can be assigned a code symbol. The record would show how much time was spent on particular topics during the lecture and the sequence whereby one topic follows another. Second, some system of classifying the kinds of knowledge, such as the seven types of questions which were suggested by Sanders,

could be used as a second classification. A third cluster might consist of first statement, illustration or application or explanation, and then restatement and summary. By using three code digits, the topic, level of abstraction, and restatement emphasis could be traced during a lecture.

Initiative in pupil thinking

The traditional method of encouraging pupil initiative in thinking has centered on individual projects, homework, seatwork, laboratory experimentation, creative writing, and similar activities. Thoughtless preparation for such activities can result in suppressing initiative and limiting the experience to following directions, completing highly structured assignments, and simply doing what the directions say to do.

Curriculum revision with new instructional materials has been one answer to this problem. It is not yet clear whether such innovations will achieve pupil initiative in thinking. For example, in an extensive five-state field study to assess any differences in classroom interaction when new mathematics materials were used, the evidence (107, pp. 1–12) is not very convincing. The new materials were designed to elicit more pupil initiative in thinking such as creating unusual solutions to problems. Theoretically, the new materials were expected to show a higher incidence of four types of statements. The categories representing these statements were (a) pupils—independent, active, (b) teacher—confronting, seeking, (c) teacher—challenging, jolting, and (d) pupils—curious, creative. There were not enough (c) and (d) events in either the experimental or control classes to be worth noting. There were statistically significant differences in the expected directions for the first two categories, but the incidence in percent was extremely low. The contrast from "experimental" to "control" for (a) was 2.4 percent to 1.9 and for (b) 1.4 to 0.9. In other words, the vast majority, some 97 percent of the classroom interaction, was more or less the same when the new materials were used. In this project, the experimental teachers attended a summer workshop prior to attempting to use the new materials. What is disturbing, then, is that even with widely disseminated mathematics curricula involving materials designed and developed at four centers,* the hoped for effects on pupil initiative in thinking did not appear during classroom interaction. Although there was more attention given to "the structure of mathematics" in the experimental classes, there was no corresponding change in the thinking of pupils. Teachers still tended to dominate, asked narrow questions, and the pupils responded in a highly controlled fashion.

*The materials came from Ball State University, the University of Illinois Committee on School Mathematics, the School Mathematics Study Group, and the University of Maryland Mathematics Evaluation Project.

Programmed instructional materials might be another response to increasing pupil initiative in thinking. At this time, however, no data indicating whether pupils can show more initiative in thinking, as a result of using such materials has come to my attention.

With the present evidence, no firm conclusions are possible concerning how to increase the initiative of pupil thinking. The most promising leads appear to be untested and these would occur when a teacher has learned how to facilitate this kind of behavior and has the time and materials to help in forming the necessary cognitive skills.

RECONSTRUCTING WHAT HAS BEEN PROPOSED

This chapter began with a "call" to inquiry and by suggesting that the *means* of self-development demand as much attention and careful planning as the subject matter outcomes. Throughout these activities the analysis of classroom interaction, the desired behavior of pupils, and the complementary behavior of the teacher become the focus of nearly all activities. A generalized procedure included asking:

1) What target pupil behaviors would you like to have occurring in your classroom?
2) What patterns of teaching behavior, in each case more than one, are most likely to support the desired pupil behavior?
3) How much practice do you need to be sure that you can produce the proposed teaching behavior patterns, and can you be sure that your partner can code these patterns?
4) What plan of investigation will give you the most information in comparing each alternative teaching pattern?
5) After conducting the investigation, what conclusions have you reached about how best to produce the desired target behaviors?

These five questions formed a cycle of inquiry which could be used equally well by the least skillful as well as the most advanced teachers. In fact, self-development of teaching skill was seen as the result of recycling these five steps through a series of increasingly complex problems, each adjusted to the present interest of the participants and incorporating procedures which match current skills of inquiry.

In order to protect independence and self-direction, yet obtain a degree of objectivity greater than one person can normally create, a partnership was proposed as the unit of action. These partnerships were the products of working liasons formed in a study group of four to eight persons. A director for these activities would arrange large audience meetings for the study teams, help to

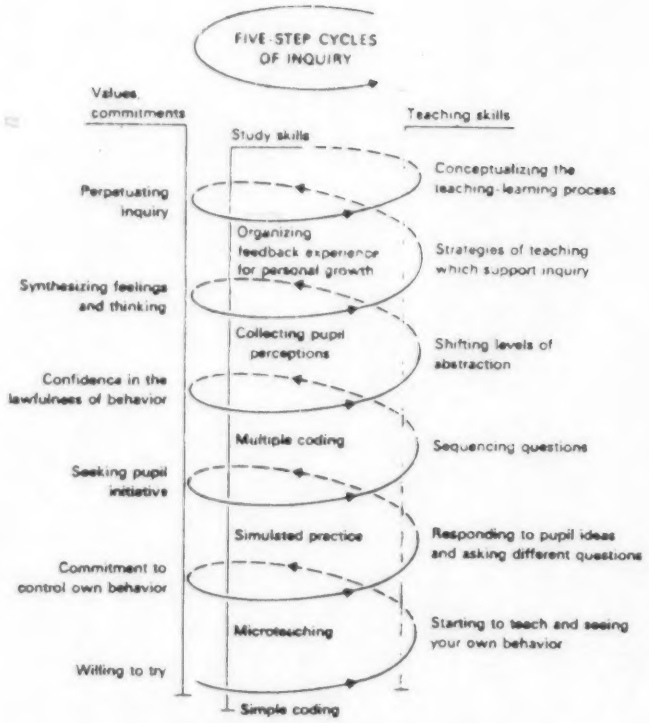


Fig. 9–10. Curriculum Elements in Professional Self-Development (after Hilda Taba).

secure instructional materials, and work to resolve the many problems that would arise.

A schematic organization of these curriculum elements has much in common with Hilda Taba's (98, p. 11) conception of spiral concept development. Such an organization is illustrated in Fig. 9–10. Each spiral consists of a five-step cycle of inquiry. The values and commitments listed on the left are all a part of each cycle and are not necessarily arranged into an expected sequence. The phrases on the right suggest increasingly complex teaching skills which become the objectives of study and self-development. The study skills, or at least some of them, are listed in the center, showing an increase in the ability of the participants to work on their own problems and to help others.

The main thrust of these self-development activities is toward more independence and self-direction on the part of pupils. The activities include the study and control of teaching behavior which facilitates the desired pupil behavior. The starting point is at whatever level of interest and ability the participants may possess. The activities can be maintained at whatever level the available energy and resources permit. Thus, with beginning teachers, a project may center on simple notions—such as, a teacher can provide opportunities for a pupil to answer by keeping his mouth shut after asking a question so that there is a reasonable opportunity for an answer to be formulated and expressed by a pupil. Such a problem can be investigated with the five steps of inquiry, including alternatives, other than tolerating silence, which a teacher can use to help pupils formulate thoughtful answers. The same five steps can also be used to study very complex teaching strategies in which shifts in teaching behavior follow models of thinking and the advantages, or disadvantages, of several different strategies can be compared.

The propositions in this chapter are considered equally relevant to college students who seek to become beginning teachers as well as to experienced teachers who participate in continuing professional education.

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